DECLARATION OF DR. RANDELL L. MILLS

I, Randell L. Mills, declare and state as follows:

1. I am the founder and CEO of BlackLight Power, Inc., located at 493 Old Trenton Road, Cranbury, New Jersey 08512.

2. I majored in chemistry and received my bachelor of arts degree, *summa cum laude* and Phi Beta Kappa, from Franklin & Marshall College in 1982. I received a medical degree from Harvard Medical School in 1986. While attending Harvard Medical School, I concurrently spent a year taking courses in advanced electrical engineering at the Massachusetts Institute of Technology. I have also had significant academic training in biology, chemistry, mathematics and physics.

3. I began my research in the field of energy technology over ten years ago. I have authored, co-authored or collaborated on numerous publications, reports and presentations at scientific meetings in the field of energy technology and novel hydrogen chemistry, as shown in the attachment hereto.

4. I am fully qualified to conduct the research that led to the discovery and development of BlackLight's lower-energy hydrogen technology.

5. I personally conducted and/or supervised the experimental data disclosed in the articles submitted to the U.S. Patent and Trademark Office ("PTO"), which are described in the following Paragraph Nos. 6 through 15. The coauthors, if any, assisted me in preparing the data.

6. **R. L. Mills, "The Nature of the Chemical Bond Revisited and an Alternative Maxwellian Approach," J. Phys. D., submitted.** (*Web Publication Date: Aug. 6, 2003.*)

It is taught that the chemical bond exists due to a phenomenon that is unique to quantum mechanics. Specifically, the nature of the chemical bond is based on a nonphysical "exchange integral" that is a consequence of a postulated linear combination of product wavefunctions wherein it is implicit that each point electron with infinite self-electric-and-magnetic-field energies must exist as a "probability-wave cloud" and be in two places at the same time (i.e. centered on two nuclei simultaneously!) A further nonphysical aspect is that the molecular solution is obtained without considering the nuclei to move under the Born-Oppenheimer approximation; yet, the molecule must have a further nonphysical perpetual-motion-type property of "zero-point vibration." Additional internal inconsistencies arise. The electron clouds mutually shield the nuclear charge to provide an adjustable parameter, "effective nuclear charge"; yet, neither has any self shielding effect even

though the clouds are mutually indistinguishable and must classically result in a self interaction force equivalent to 1/2 the central attractive force. Furthermore, the hydrogen molecule is electron-spin paired. The magnitude of the corresponding force between the point electrons is equivalent to the electric force as the separation goes to zero. This term as well as the self-interaction term are conspicuously absent from the Hamiltonian. Instead arbitrary types of variational parameters of the wavefunctions and mixing of wavefunctions as well as other adjustable parameters such as the effective nuclear charge, ionic character, and correlation interactions are introduced to force the solutions of a multitude of methods such as valance bond, valance bond plus ionic terms, molecular orbital theory, molecular-orbital with configuration interaction, self consistent field method, SCF-LCAO-MO, Hartree-Fock, Slater orbitals, ionic terms, valence-shell electron-pair-repulsion (VSEPR) method, etc. to more closely approximate the experimental parameters. Yet, the experimental bond energy is not calculated; rather a parameter D_e is determined from which the "zero-point vibration" is subtracted and "anharmonicity term in the zero-point vibration" is added to obtain the experimentally measurable bond energy D_0. Zero-point vibration has never been directly measured, it violates the second law of thermodynamics, and it is in conflict with direct experimental results such as the formation of solid hydrogen and Bose-Einstein condensates of molecules. As a consequence, the bond energy predictions of quantum mechanics have never been tested experimentally, and it is not possible to state that the methods predict the experimental bond energy at all. The many conflicting attempts suffer from the same short comings that plague atomic quantum theory, infinities, instability with respect to radiation according to Maxwell's equations, violation of conservation of linear and angular momentum, lack of physical relativistic invariance, etc. From a physical perspective, the implication for the basis of the chemical bond according to quantum mechanics being the exchange integral and the requirement of zero-point vibration, "strictly quantum mechanical phenomena", is that the theory can not be a correct description of reality. A proposed solution based on physical laws and fully compliant with Maxwell's equations solves the parameters of molecular ions and molecules of hydrogen isotopes in closed form equations with fundamental constants only. The agreement is remarkable. A physical basis for density functional theory may exist.

---

7. R. L. Mills, P. Ray, M. Nansteel, J. He, X. Chen, A. Voigt, B. Dhandapani, "Energetic Catalyst-Hydrogen Plasma Reaction Forms a New State of Hydrogen," in preparation.

Plasmas of certain catalysts such as Sr^+, Ar^+, Ne^+, and He^+ mixed with hydrogen were studied for evidence of a novel energetic reaction. A hydrogen plasma was observed to form at low temperatures (e.g. $\approx 10^3\ K$) and an extraordinary low field strength of about 1-2 V/cm when argon and strontium were present with atomic hydrogen. RF and microwave plasmas were used to generate He^+, Ne^+, and Ar^+ catalysts. Extraordinarily fast H (40-50 eV) was observed by Balmer α line broadening only from plasmas having a catalyst with H. Novel extreme ultraviolet (EUV) emission lines were observed that corresponded to a Rydberg

series of H corresponding to fractional principal quantum numbers wherein $n = \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \ldots, \frac{1}{p}$; ($p \leq 137$ is an integer) replaces the well known parameter n = integer in the Rydberg equation for hydrogen excited states. Corresponding emission due to fraction-principal-quantum-level hydrogen molecular ion $H_2^+(1/p)$ and molecular hydrogen $H_2(1/p)$ were also observed. $H_2(1/p)$ gas was isolated by liquefaction using an high-vacuum (10^{-6} Torr) capable, liquid nitrogen cryotrap and was characterized by mass spectroscopy (MS), EUV optical emission spectroscopy (EUV OES), and ^1H NMR of the condensable gas dissolved in $CDCl_3$. The condensable gas was highly pure mass two by MS. A unique EUV emission spectrum was observed by OES. The observation that the novel EUV emission spectrum shifted with deuterium substitution in a region where no hydrogen emission has ever been observed strongly supported the existence of lower-energy molecular hydrogen. Contaminants and exotic helium-hydrogen species were eliminated as the source of the reaction and condensed gas plasma emission spectra. Upfield shifted NMR peaks were observed at 2.18 and 3.47 ppm compared to that of H_2 at 4.63 ppm. Excess power was absolutely measured from the helium-hydrogen plasma. For an input of 41.9 W, the total plasma power of the helium-hydrogen plasma measured by water bath calorimetry was 62.1 W corresponding to 20.2 W of excess power in 3 cm^3. The excess power density and energy balance were high, 6.7 W/cm^3 and $-5.4\ X10^4\ kJ/mole\ H_2$ ($280\ eV/H\ atom$), respectively.

8. **R. L. Mills, P. Ray, M. Nansteel, J. He, X. Chen, A. Voigt, B. Dhandapani, Luca Gamberale, "Energetic Catalyst-Hydrogen Plasma Reaction as a Potential New Energy Source", European Physical Journal D, submitted.** (*Web Publication Date: June 6, 2003.*)

Plasmas of certain catalysts such as Sr^+, Ar^+, Ne^+, and He^+ mixed with hydrogen were studied for evidence of a novel energetic reaction. A hydrogen plasma was observed to form at low temperatures (e.g. $\approx 10^3\ K$) and an extraordinary low field strength of about 1-2 V/cm when argon and strontium were present with atomic hydrogen. RF and microwave plasmas were used to generate He^+, Ne^+, and Ar^+ catalysts. Extraordinarily fast H (40-50 eV) was observed by Balmer α line broadening only from plasmas having a catalyst with H. Novel extreme ultraviolet (EUV) emission lines were observed that corresponded to a Rydberg series of H corresponding to fractional principal quantum numbers wherein $n = \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \ldots, \frac{1}{p}$; ($p \leq 137$ is an integer) replaces the well known parameter n = integer in the Rydberg equation for hydrogen excited states. Corresponding emission due to fraction-principal-quantum-level hydrogen molecular ion $H_2^+(1/p)$ and molecular hydrogen $H_2(1/p)$ were also observed. $H_2(1/p)$ gas was isolated by liquefaction using an high-vacuum (10^{-6} Torr) capable, liquid nitrogen cryotrap and was characterized by gas chromatography (GC), mass spectroscopy (MS), visible and EUV optical emission spectroscopy (OES), and ^1H NMR of the condensable gas dissolved in $CDCl_3$. Novel peaks were observed by cryogenic gas chromatography performed on the condensable gas which was highly pure hydrogen by MS and had a higher ionization energy

than H_2. A unique EUV emission spectrum was observed by OES. The observation that the novel EUV emission spectrum shifted with deuterium substitution in a region where no hydrogen emission has ever been observed strongly supported the existence of lower-energy molecular hydrogen. Contaminants and exotic helium-hydrogen species were eliminated as the source of the reaction and condensed gas plasma emission spectra. Upfield shifted NMR peaks were observed at 3.22, 3.25, and 3.47 ppm compared to that of H_2 at 4.63 ppm. Excess power was absolutely measured from the helium-hydrogen plasma. For an input of 44.3 W, the total plasma power of the helium-hydrogen plasma measured by water bath calorimetry was 62.9 W corresponding to 18.6 W of excess power in 3 cm^3. The excess power density and energy balance were high, 6.2 W/cm^3 and $-5\,X\,10^4$ $kJ/mole\ H_2$ (240 $eV/H\ atom$), respectively.

9. **R. Mills, P. Ray, "New H I Laser Medium Based on Novel Energetic Plasma of Atomic Hydrogen and Certain Group I Catalysts", J. Plasma Physics, submitted.**

Rb^+ to Rb^{2+} and $2K^+$ to $K + K^{2+}$ each provide a reaction with a net enthalpy equal to the potential energy of atomic hydrogen. The presence of these gaseous ions with thermally dissociated hydrogen formed a plasma having strong VUV emission with a stationary inverted Lyman population. Significant Balmer α line broadening of 18 and 12 eV was observed from a rt-plasma of hydrogen with KNO_3, and $RbNO_3$, respectively, compared to 3 eV from a hydrogen microwave plasma. We propose an energetic catalytic reaction involving a resonant energy transfer between hydrogen atoms and Rb^+ or $2K^+$ to form a very stable novel hydride ion. Its predicted binding energy of 3.0468 eV with the fine structure was observed at 4071 Å, and its predicted bound-free hyperfine structure lines $E_{HF} = j^2 3.00213\,X\,10^{-5} + 3.0563\ eV$ (j is an integer) matched those observed for $j = 1$ to $j = 37$ to within a 1 part per 10^4. Characteristic emission from each catalyst was observed. This catalytic reaction may pump a cw HI laser.

10. **R. L. Mills, P. Ray, M. Nansteel, J. He, X. Chen, A. Voigt, B. Dhandapani, "Characterization of Energetic Catalyst-Hydrogen Plasma Reaction as a Potential New Energy Source", Am. Chem. Soc. Div. Fuel Chem. Prepr., Vol. 48, No. 2, (2003).**

The possibility that a novel reaction of atomic hydrogen that uses certain catalysts such as He^+, oxygen, and Group I atoms or ions may be a clean new energy source is supported by spectroscopic, chemical, and thermal data. For example, we report the discovery of new states of hydrogen formed in a catalytic plasmas reaction. The states were identified by the spectroscopic observation of emission lines occurring at energies that are an extension of the Rydberg series to lower states. The novel molecular hydrogen gas product was isolated by liquefaction at liquid nitrogen temperature, and was identified by the observations of novel peaks by cryogenic gas chromatography, a higher ionization energy than H_2 by mass spectroscopy, a unique EUV emission spectrum by optical emission spectroscopy that shifted with deuterium substitution in a region where no hydrogen emission has ever been observed, and upfield shifted NMR peaks at 3.22 and 3.47

ppm compared to that of H_2 at 4.63 ppm. In addition, stationary H populations were formed by using certain catalysts in hydrogen plasmas, and novel processes and hydride products with significant commercial potential were characterized by EUV and visible spectroscopy, NMR, ToF-SIMS, and XPS. Very high (>100 eV) H energies and substantial excess thermal energy were observed.

11. **R. Mills, P. C. Ray, R. M. Mayo, M. Nansteel, W. Good, P. Jansson, B. Dhandapani, J. He, "Hydrogen Plasmas Generated Using Certain Group I Catalysts Show Stationary Inverted Lyman Populations and Free-Free and Bound-Free Emission of Lower-Energy State Hydride", Technical Physics, submitted.**

Rb^+ to Rb^{2+} and $2K^+$ to $K + K^{2+}$ each provide a reaction with a net enthalpy equal to the potential energy of atomic hydrogen. The presence of these gaseous ions with thermally dissociated hydrogen formed a plasma having strong VUV emission with a stationary inverted Lyman population. Significant Balmer α line broadening of 18 and 12 eV was observed from a rt-plasma of hydrogen with KNO_3, and $RbNO_3$, respectively, compared to $3\ eV$ from a hydrogen microwave plasma. The reaction was exothermic since excess power of about 20 mW/cc was measured by Calvet calorimetry. We propose an energetic catalytic reaction involving a resonance energy transfer between hydrogen atoms and Rb^+ or $2K^+$ to form a very stable novel hydride ion. Its predicted binding energy of $3.0468\ eV$ with the fine structure was observed at 4071 Å, and its predicted bound-free hyperfine structure lines $E_{HF} = j^2 3.00213\ X\ 10^{-5} + 3.0563\ eV$ (j is an integer) matched those observed for $j = 1$ to $j = 37$ to within a 1 part per 10^4. Characteristic emission from each catalyst was observed. This catalytic reaction may pump a cw HI laser.

12. **R. Mills, J. Sankar, A. Voigt, J. He, P. Ray, B. Dhandapani, "Role of Atomic Hydrogen Density and Energy in Low Power CVD Synthesis of Diamond Films", JACS, in preparation.**

Polycrystalline diamond films were synthesized on silicon substrates without diamond seeding by a very low power (~40-80 W) microwave plasma continuous vapor deposition (MPCVD) reaction of a mixture of helium-hydrogen-methane (48.2/48.2/3.6%) or argon-hydrogen-methane (17.5/80/2.5%). But, only diamond-like carbon (DLC) films or no films formed when neon, krypton, or xenon was substituted for helium or argon. The films were characterized by time of flight secondary ion mass spectroscopy (ToF-SIMS), X-ray photoelectron spectroscopy (XPS), Raman spectroscopy, scanning electron microscopy (SEM), and X-ray diffraction (XRD). It is proposed that each of He^+ and Ar^+ served as a catalyst with atomic hydrogen to form an energetic plasma since only plasmas having these ions in the presence of atomic hydrogen showed significantly broadened H α lines corresponding to an average hydrogen atom temperature of >100 eV as reported previously [R. L. Mills, P. Ray, B. Dhandapani, R. M. Mayo, J. He, "Comparison of Excessive Balmer α Line Broadening of Glow Discharge and Microwave Hydrogen Plasmas with Certain Catalysts", J. of Applied Physics, (2002), Vol. 92, No. 12, pp. 7008-7022]. It was found that not only the energy, but also the H density

uniquely increases in $He\text{-}H_2$ and $Ar\text{-}H_2$ plasmas. Bombardment of the carbon surface by highly energetic hydrogen formed by the catalysis reaction may play a role in the formation of diamond. Then, by this novel pathway, the relevance of the CO tie line is eliminated along with other stringent conditions and complicated and inefficient techniques which limit broad application of the versatility and superiority of diamond thin film technology.

13. **R. Mills, B. Dhandapani, M. Nansteel, J. He, P. Ray, "Liquid-Nitrogen-Condensable Molecular Hydrogen Gas Isolated from a Catalytic Plasma Reaction", J. Phys. Chem. B, submitted.**

Extreme ultraviolet (EUV) spectroscopy was recorded on microwave discharges of helium with 2% hydrogen. Novel emission lines were observed with energies of $q \cdot 13.6\ eV$ where $q = 1,2,3,4,6,7,8,9,11$ or these discrete energies less $21.2\ eV$ corresponding to inelastic scattering of these photons by helium atoms due to excitation of $He(1s^2)$ to $He(1s^1 2p^1)$. These lines matched $H(1/p)$, fractional Rydberg states of atomic hydrogen, formed by a resonant nonradiative energy transfer to He^+. Corresponding emission due to the reaction $2H(1/2) \rightarrow H_2(1/2)$ with vibronic coupling at $E_{D+vib} = p^2 E_{D\,H_2} \pm \left(\frac{\upsilon^*}{3}\right) E_{vib\,H_2(\upsilon=0\rightarrow\upsilon=1)}$, $\upsilon^* = 1,2,3...$ was observed at the longer wavelengths for $\upsilon^* = 2$ to $\upsilon^* = 32$ and at the shorter wavelengths for $\upsilon^* = 1$ to $\upsilon^* = 16$ where $E_{D\,H_2}$ and $E_{vib\,H_2(\upsilon=0\rightarrow\upsilon=1)}$ are the experimental bond and vibrational energies of H_2, respectively. Fraction-principal-quantum-level molecular hydrogen $H_2(1/p)$ gas was isolated by liquefaction using an high-vacuum (10^{-6} torr) capable, liquid nitrogen cryotrap and was characterized by gas chromatography (GC), mass spectroscopy (MS), visible and EUV optical emission spectroscopy (OES), and ^1H NMR of the condensable gas dissolved in $CDCl_3$. Novel peaks were observed by cryogenic gas chromatography performed on the condensable gas which was highly pure hydrogen by MS and had a higher ionization energy than H_2. A unique EUV emission spectrum was observed by OES. The observation that the novel EUV emission spectrum shifted with deuterium substitution in a region where no hydrogen emission has ever been observed unequivocally confirmed the existence of lower-energy molecular hydrogen. Contaminants and exotic helium-hydrogen species were eliminated as the source of the reaction and condensed gas plasma emission spectra. Upfield shifted NMR peaks were observed at 3.22 and 3.47 ppm compared to that of H_2 at 4.63 ppm.

14. **R. L. Mills, P. Ray, J. He, B. Dhandapani, M. Nansteel, "Novel Spectral Series from Helium-Hydrogen Evenson Microwave Cavity Plasmas that Matched Fractional-Principal-Quantum-Energy-Level Atomic and Molecular Hydrogen", European Journal of Physics, submitted.** (*Web Publication Date: April 24, 2003.*)

Extreme ul recorded on 85 W Evenson microwave cavity discharges of helium with 2% hydrogen. Novel emission lines were observed with energies of $q \cdot 13.6\ eV$ where $q = 1,2,3,4,6,7,8,9,11$ or these

discrete energies less $21.2\ eV$ corresponding to inelastic scattering of these photons by helium atoms due to excitation of $He(1s^2)$ to $He(1s^1 2p^1)$. These lines matched $H(1/p)$, fractional Rydberg states of atomic hydrogen, formed by a resonant nonradiative energy transfer to He^+. Corresponding emission due to the reaction $2H(1/2) \rightarrow H_2(1/2)$ with vibronic coupling at $E_{D+vib} = p^2 E_{D\,H_2} \pm \left(\frac{\upsilon^*}{3}\right) E_{vib\,H_2(\upsilon=0\rightarrow\upsilon=1)}$, $\upsilon^* = 1,2,3...$ was observed at the longer wavelengths for $\upsilon^* = 2$ to $\upsilon^* = 32$ and at the shorter wavelengths for $\upsilon^* = 1$ to $\upsilon^* = 16$ where $E_{D\,H_2}$ and $E_{vib\,H_2(\upsilon=0\rightarrow\upsilon=1)}$ are the experimental bond and vibrational energies of H_2, respectively. Replacement of hydrogen with deuterium eliminates the resonance condition for emission, and none of the peaks of the $E_{D+vib} = 17.913 \pm \left(\frac{\upsilon^*}{3}\right) 0.515902\ eV$ series observed in the hydrogen mixed plasmas were observed with deuterium substitution. The Evenson cavity was scaled-up to operate at 600 W input power, and an additional intense peak was observed at $41.6\ nm$. This peak with an energy of $29.81\ eV$ matched $q \cdot 13.6\ eV$ with $q = 4$ less $24.58741\ eV$ corresponding to inelastic scattering of these photons by helium atoms due to ionization of He to He^+.

15. **R. L. Mills, P. Ray, R. M. Mayo, Highly Pumped Inverted Balmer and Lyman Populations, New Journal of Physics, submitted.**

Comprehensive Studies on our recent brief publication [R. Mills, P. Ray and R. M. Mayo, "The Potential for a Hydrogen Water-Plasma-Laser", Applied Physics Letters, Vol. 82, No. 11, 2003, pp. 1679-1681] on the potential of realizing a CW H I laser based on a water vapor plasma are presented. Stationary inverted H Balmer and Lyman populations were observed from a low pressure water-vapor microwave discharge plasma. The ionization and population of excited atomic hydrogen levels was attributed to energy provided by a catalytic resonant energy transfer between hydrogen atoms and molecular oxygen formed in the water plasma. The catalysis mechanism was supported by the observation of O^{2+} and H Balmer line broadening of 55 eV compared to 1 eV for hydrogen alone. The high hydrogen atom temperature with a relatively low electron temperature, T_e = 2 eV, exhibited characteristics of cold recombining plasmas. These conditions of a water plasma favored an inverted population in the lower levels. Thus, the catalysis of atomic hydrogen may pump a cw H I laser. From our results, laser oscillations are may be possible from (i) n = 3, n = 4, n = 5, n = 6, n = 7, and n = 8 to n = 2, (ii) n = 4, n = 5, n = 6, and n = 7 to n = 3, and (iii) n = 5, and n = 6 to n = 4. Lines of the Balmer series of n = 5, and n = 6 to n = 2 and the Paschen series of n = 5 to n = 3 were of particular importance because of the potential to design blue and 1.3 micron infrared lasers, respectively, which are ideal for many communications and microelectronics applications. At an average microwave input power of 9 W · cm^{-3}, a collisional radiative model showed that the hydrogen excited state population distribution was consistent with an $n = 1 \rightarrow 5,6$ pumping power of an unprecedented 200 W · cm^{-3}. Back illumination with an infrared source showed depopulation of the n = 5 state. High power hydrogen gas lasers are anticipated at wavelengths, over a broad spectral range from far infrared to violet which

may be miniaturized to micron dimensions. Such a hydrogen laser represents the first new atomic gas laser in over a decade, and it may prove to be the most efficient, versatile, and useful of all. A further application is the direct generation of electrical power using photovoltaic conversion of the spontaneous or stimulated water vapor plasma emission.

16. **R. L. Mills, P. Ray, J. Dong, M. Nansteel, R. M. Mayo, B. Dhandapani, X. Chen, "Comparison of Balmer α Line Broadening and Power Balances of Helium-Hydrogen Plasma Sources", Plasma Sources Science and Technology, submitted.** (*Web Publication Date: March 12, 2003.*)

From the width of the 656.3 nm Balmer α line emitted from glow discharge, Evenson microwave, MKS/Astex microwave, and inductively coupled RF plasmas, it was found that Evenson cavity microwave helium-hydrogen plasmas showed significant broadening corresponding to an average hydrogen atom energy of $180-210\,eV$ with only a fast population. Inductively coupled RF helium-hydrogen plasmas showed extraordinary broadening corresponding to an average hydrogen atom energy of $250-310\,eV$, but the fast population was a minor component compared to the slow of $\approx 35\,eV$. The corresponding results from the glow discharge plasmas were $33-38\,eV$ and $30-35\,eV$, respectively, compared to $\approx 4\,eV$ for plasmas of pure hydrogen and xenon-hydrogen maintained in any of the sources and helium-hydrogen plasmas maintained in the MKS/Astex microwave system. Stark broadening or acceleration of charged species due to high electric fields can not explain the microwave and inductively coupled RF results since the electron density was low and no high field was present. Rather, a resonant energy transfer mechanism is proposed, and the corresponding exothermic reaction was confirmed by power balance measurements. With an input of 24.8± 1 W, the total plasma power of the Evenson microwave helium-hydrogen plasma measured by water bath calorimetry was 49.1 ± 1 W corresponding to 24.3 ± 1 W of excess power in 3 cm^3. The excess power density and energy balance were high, 8.1 W/cm^3 and over $-3\,X\,10^4\,kJ/mole\,H_2$, respectively. With an input of 500 W, a total power of 623 W was generated in a 45 cm^3 compound-hollow-cathode-glow discharge. Less than 10% excess power was observed from inductively coupled RF helium-hydrogen plasmas. No measurable heat was observed from MKS/Astex microwave helium-hydrogen plasmas.

17. **R. Mills, P. Ray, M. Nansteel, R. M. Mayo, "Comparison of Water-Plasma Sources of Stationary Inverted Balmer and Lyman Populations for a CW HI Laser", J. Appl. Spectroscopy, in preparation.**

Stationary inverted H Balmer and Lyman populations were observed from a low pressure water-vapor Evenson microwave discharge plasma, but not from glow discharge, RF, and microwave plasmas maintained in several other microwave cavity types. The ionization and population of excited atomic hydrogen levels in the plasma maintained in the Evenson cavity was attributed to energy provided by a catalytic resonant energy transfer between hydrogen atoms and molecular oxygen formed in the water plasma. The catalysis mechanism was supported by the observation of O^{2+} and H Balmer line broadening of 55 eV compared to 1 eV for

hydrogen alone. The high hydrogen atom temperature with a relatively low electron temperature, $T_e = 2\ eV$, exhibited characteristics of cold recombining plasmas. These conditions of a water plasma favored an inverted population in the lower levels. Thus, the catalysis of atomic hydrogen may pump a cw HI laser. From our results, laser oscillations are may be possible from i) $n = 3$, $n = 4$, $n = 5$, $n = 6$, $n = 7$ and $n = 8$ to $n = 2$, ii) $n = 4$, $n = 5$, $n = 6$, and $n = 7$ to $n = 3$ and iii) $n = 5$ and $n = 6$ to $n = 4$. Lines of the Balmer series of $n = 5$, and $n = 6$ to $n = 2$ and the Paschen series of $n = 5$ to $n = 3$ were of particular importance because of the potential to design blue and 1.3 micron infrared lasers, respectively, which are ideal for many communications and microelectronics applications. At a microwave input power of $9\ W \cdot cm^{-3}$, a collisional radiative model showed that the hydrogen excited state population distribution was consistent with an $n = 1 \rightarrow 5,6$ pumping power of an unprecedented $200\ W \cdot cm^{-3}$. High power hydrogen gas lasers are anticipated at wavelengths, over a broad spectral range from far infrared to violet which may be miniaturized to micron dimensions. Such a hydrogen laser represents the first new atomic gas laser in over a decade, and it may prove to be the most efficient, versatile, and useful of all. A further application is the direct generation of electrical power using photovoltaic conversion of the spontaneous or stimulated water vapor plasma emission.

18. **R. Mills, J. Sankar, A. Voigt, J. He, P. Ray, B. Dhandapani, "Synthesis and Characterization of Diamond Films from MPCVD of an Energetic Argon-Hydrogen Plasma and Methane", Materials Science, submitted.** (*Web Publication Date: May 7, 2003.*)

Polycrystalline diamond films were synthesized on silicon substrates by a low power (~80 W) microwave plasma chemical vapor deposition (MPCVD) reaction of a mixture of argon-hydrogen-methane (17.5/80/2.5%). The films were characterized by time of flight secondary ion mass spectroscopy (ToF-SIMS), X-ray photoelectron spectroscopy (XPS), Raman spectroscopy, scanning electron microscopy (SEM), and X-ray diffraction (XRD). It is proposed that Ar^+ served as a catalyst with atomic hydrogen to form an energetic plasma. CH, C_2, and C_3 emissions were observed with significantly broadened H α line. The average hydrogen atom temperature of a argon-hydrogen-methane plasma was measured to be $110 - 130\ eV$ versus $\approx 3\ eV$ for pure hydrogen. Bombardment of the carbon surface by highly energetic hydrogen formed by the catalysis reaction may play a role in the formation of diamond. Then, by this novel pathway, the relevance of the CO tie line is eliminated along with other stringent conditions and complicated and inefficient techniques which limit broad application of the versatility and superiority of diamond thin film technology.

19. **R. Mills, P. Ray, B. Dhandapani, W. Good, P. Jansson, M. Nansteel, J. He, A. Voigt, "Spectroscopic and NMR Identification of Novel Hydride Ions in Fractional Quantum Energy States Formed by an Exothermic Reaction of Atomic Hydrogen with Certain Catalysts", European Physical Journal-Applied Physics, submitted.** (*Web Publication Date: Feb. 21, 2003.*)

$2K^+$ to $K + K^{2+}$ and K to K^{3+} provide a reaction with a net enthalpy equal to the one and three times the potential energy of atomic hydrogen, respectively. The presence of these gaseous ions or atoms with thermally dissociated hydrogen formed a so-called resonance transfer (rt) plasma having strong VUV emission with a stationary inverted Lyman population. Significant line broadening of the Balmer α, β, and γ lines of 18 eV was observed, compared to 3 eV from a hydrogen microwave plasma. Emission from rt-plasmas occurred even when the electric field applied to the plasma was zero. The reaction was exothermic since excess power of 20 $mW \cdot cm^{-3}$ was measured by Calvet calorimetry. An energetic catalytic reaction was proposed involving a resonant energy transfer between hydrogen atoms and $2K^+$ or K to form very stable novel hydride ions $H^-(1/p)$ called hydrino hydrides having a fractional principal quantum numbers $p = 2$ and $p = 4$, respectively. Characteristic emission was observed from K^{2+} and K^{3+} that confirmed the resonant nonradiative energy transfer of $27.2\ eV$ and $3 \cdot 27.2\ eV$ from atomic hydrogen to $2K^+$ and K, respectively.

The predicted binding energy of $H^-(1/2)$ of $3.0471\ eV$ with the fine structure was observed at 4071 A, and its predicted bound-free hyperfine structure lines $E_{HF} = j^2 3.00213\ X 10^{-5} + 3.0563\ eV$ (j is an integer) matched those observed for $j = 1$ to $j = 37$ to within a 1 part per 10^4. $H^-(1/4)$ was observed spectroscopically at $110\ nm$ corresponding to its predicted binding energy of $11.2\ eV$. The ^1H MAS NMR spectrum of novel compound $KH*Cl$ relative to external tetramethylsilane (TMS) showed a large distinct upfield resonance at -4.4 corresponding to an absolute resonance shift of -35.9 ppm that matched the theoretical prediction of p = 4. A novel peak of $KH*I$ at -1.5 ppm relative to TMS corresponding to an absolute resonance shift of -33.0 ppm matched the theoretical prediction of p = 2. The predicted catalyst reactions, position of the upfield-shifted NMR peaks, and spectroscopic data for $H^-(1/2)$ and $H^-(1/4)$ were found to be in agreement.

20. **R. L. Mills, The Fallacy of Feynman's Argument on the Stability of the Hydrogen Atom According to Quantum Mechanics, Foundations Phys., submitted.** (*Web Publication Date: Jan. 27, 2003.*)

An old argument from Feynman [1] based on the Heisenberg Uncertainty Principle (HUP) was recently posted by Krieg [2] in an attempt to show that standard quantum theories (SQM) preclude the existence lower-energy hydrogen states, predicted [3-5] and now reported by Mills et al. [6-9] which represents a possible new hydrogen energy source. Rather than achieving this goal, Feynman's argument is shown to be internally inconsistent and fatally flawed, and Krieg's posting of this argument further brings to light the many inconsistencies and shortcomings of SQM and the intrinsic HUP that have not been resolved from the days of the inception of SQM. Unfortunately these issues are largely ignored by the physics community.

21. **R. Mills, J. He, B. Dhandapani, P. Ray, "Comparison of Catalysts and Microwave Plasma Sources of Vibrational Spectral Emission of Fractional-Rydberg-State Hydrogen Molecular Ion", Canadian Journal of Physics, submitted.**

Novel emission lines with energies of $q \cdot 13.6\ eV$ where $q = 1,2,3,4,6,7,8,9,\ or\ 11$ were previously observed by extreme ultraviolet (EUV) spectroscopy recorded on microwave discharges of helium with 2% hydrogen [R. Mills, P. Ray, Int. J. Hydrogen Energy, Vol. 27, No. 3, pp. 301-322]. These lines matched $H(1/p)$, fractional Rydberg states of atomic hydrogen where p is an integer, formed by a resonant nonradiative energy transfer to He^+ acting as a catalyst. Ne^+ and Ar^+ also serve as catalysts to form $H(1/p)$; whereas, krypton, xenon, and their ions serve as controls. $H(1/p)$ may react with a proton to form a molecular ion $H_2^*(1/p)^+$ that has a bond energy and vibrational levels that are p^2 times those of the molecular ion comprising uncatalyzed atomic hydrogen. Extreme ultraviolet (EUV) spectroscopy was recorded on microwave plasmas of the noble gases mixed with 10% hydrogen in the range 10-65 nm. Emission in this region due to the reaction $H(1/4)+H^+ \rightarrow H_2(1/4)^+$ with vibronic coupling at $E_{D+vib} = 4^2 E_{D\,H_2^*} \pm \upsilon^* 2^2 E_{vib\,H_2^*(\upsilon=0\rightarrow\upsilon=1)}$, $\upsilon^* = 0,1,2,3...$ was observed at the longer wavelengths for $\upsilon^* = 0$ to $\upsilon^* = 20$ and at the shorter wavelengths for $\upsilon^* = 0$ to $\upsilon^* = 3$ where $E_{D\,H_2^*}$ and $E_{vib\,H_2^*(\upsilon=0\rightarrow\upsilon=1)}$ are the experimental bond and vibrational energies of H_2^+, respectively. The vibrational series was only observed for helium, neon, and argon. In a comparison of Evenson, McCarroll, cylindrical, and Beenakker microwave cavity plasmas, the Evenson cavity consistently gave the highest intensities.

22. **R. L. Mills, P. Ray, X. Chen, B. Dhandapani, "Vibrational Spectral Emission of Fractional-Principal-Quantum-Energy-Level Molecular Hydrogen", J. of the Physical Society of Japan, submitted.** (*Web Publication Date: Sept. 9, 2002.*)

Extreme ultraviolet (EUV) spectroscopy was recorded on microwave discharges of helium with 2% hydrogen. Novel emission lines were observed with energies of $q \cdot 13.6\ eV$ where $q = 1,2,3,4,6,7,8,9,11$ or these discrete energies less $21.2\ eV$ corresponding to inelastic scattering of these photons by helium atoms due to excitation of $He(1s^2)$ to $He(1s^1 2p^1)$. These lines matched $H(1/p)$, fractional Rydberg states of atomic hydrogen, formed by a resonant nonradiative energy transfer to He^+ as recently reported [R. L. Mills, P. Ray, B. Dhandapani, J. He, "Extreme Ultraviolet Spectroscopy of Helium-Hydrogen Plasma", J. Phys. D, Applied Physics, Vol. 36, (2003), pp. 1535-1542]. In addition, the 60-100 nm-region emission was recorded. Corresponding emission due to the reaction $2H(1/2) \rightarrow H_2(1/2)$ with vibronic coupling at $E_{D+vib} = p^2 E_{D\,H_2} \pm \left(\frac{\upsilon^*}{3}\right) E_{vib\,H_2(\upsilon=0\rightarrow\upsilon=1)}$, $\upsilon^* = 1,2,3...$ was observed at the longer wavelengths for $\upsilon^* = 2$ to $\upsilon^* = 32$ and at the shorter wavelengths for $\upsilon^* = 1$ to $\upsilon^* = 16$ where $E_{D\,H_2}$ and $E_{vib\,H_2(\upsilon=0\rightarrow\upsilon=1)}$ are the experimental bond and vibrational energies of H_2, respectively. Similar emission due to Ne^+ with hydrogen was also observed, and the exothermic reaction was confirmed using water bath calorimetry. Excess power was observed from the neon-hydrogen plasma compared to control krypton plasma. For example, for an input of 37.7 W, the total plasma power of the neon-hydrogen plasma measured by water bath calorimetry was 60.7 W corresponding to 23.0 W of excess power in 3 cm^3.

23. **R. Mills, J. Sankar, P. Ray, J. He, A. Voigt, B. Dhandapani, "Spectroscopic Characterization of the Atomic Hydrogen Energies and Densities and Carbon Species During Argon-Hydrogen-Methane Plasma CVD Synthesis of Diamond Films", J. of Materials Research, submitted.**

Polycrystalline diamond films were synthesized on silicon substrates without diamond seeding by low power (80 W) microwave plasma continuous vapor deposition (MPCVD) reaction of a mixture of argon-hydrogen-methane (17.5/80/2.5%). The films were characterized by time of flight secondary ion mass spectroscopy (ToF-SIMS), X-ray photoelectron spectroscopy (XPS) (Zettlemoyer Center for Surface Studies, Sinclair Laboratory, Lehigh University, Bethlehem, PA), Raman spectroscopy (Charles Evans & Associates, Sunnyvale, CA), scanning electron microscopy (SEM) (S. S. W., University of Western Ontario, Canada), and X-ray diffraction (XRD) (IC Laboratories, Amawalk, NY). It is proposed that Ar^+ served as a catalyst with atomic hydrogen to form an energetic plasma. CH, C_2, and C_3 emissions were observed. The argon-hydrogen plasma showed a significantly broadened H Balmer α line. The average hydrogen atom temperature of a argon-hydrogen plasma was measured to be $120-140\,eV$ versus $\approx 3\,eV$ for pure hydrogen. Bombardment of the carbon surface by highly energetic hydrogen formed by the catalysis reaction may play a role in the formation of diamond. Then, by this novel pathway, the relevance of the CO tie line is eliminated along with other stringent conditions and complicated and inefficient techniques which limit broad application of the versatility and superiority of diamond thin film technology.

24. **R. Mills, P. Ray, B. Dhandapani, W. Good, P. Jansson, M. Nansteel, J. He, A. Voigt, "Spectroscopic and NMR Identification of Novel Hydride Ions in Fractional Quantum Energy States Formed by an Exothermic Reaction of Atomic Hydrogen with Certain Catalysts", J. Phys. Chem. A, submitted.**

$2K^+$ to $K+K^{2+}$ and K to K^{3+} provide a reaction with a net enthalpy equal to the one and three times the potential energy of atomic hydrogen, respectively. The presence of these gaseous ions or atoms with thermally dissociated hydrogen formed a so-called resonance transfer (rt) plasma having strong VUV emission with a stationary inverted Lyman population. Significant line broadening of the Balmer α, β, and γ lines of 18 eV was observed, compared to 3 eV from a hydrogen microwave plasma. Emission from rt-plasmas occurred even when the electric field applied to the plasma was zero as recorded at Institut für Niedertemperatur-Plasmaphysik e.V. (INP Greifswald, Germany. The reaction was exothermic since excess power of 20 $mW\cdot cm^{-3}$ was measured by Calvet calorimetry. An energetic catalytic reaction was proposed involving a resonant energy transfer between hydrogen atoms and $2K^+$ or K to form very stable novel hydride ions $H^-(1/p)$ called hydrino hydrides having a fractional principal quantum numbers $p=2$ and $p=4$, respectively. Characteristic emission was observed from K^{2+} and K^{3+} that confirmed the resonant nonradiative energy transfer of $27.2\,eV$ and $3\cdot 27.2\,eV$ from atomic hydrogen to $2K^+$ and K, respectively.

The predicted binding energy of $H^-(1/2)$ of $3.0471\,eV$ with the fine structure was observed at 4071 Å, and its predicted bound-free hyperfine structure lines $E_{HF}=j^2\,3.00213\,X\,10^{-5}+3.0563\,eV$ (j is an

integer) matched those observed for $j=1$ to $j=37$ to within a 1 part per 10^4. $H^-(1/4)$ was observed spectroscopically at $110\,nm$ corresponding to its predicted binding energy of $11.2\,eV$. The ^1H MAS NMR spectrum (Spectral Data Services, Inc., Champaign, IL) of novel compound $KH*Cl$ relative to external tetramethylsilane (TMS) showed a large distinct upfield resonance at -4.4 corresponding to an absolute resonance shift of -35.9 ppm that matched the theoretical prediction of p = 4. A novel NMR (Grace Davison, Columbia, MD and Spectral Data Services, Inc., Champaign, IL) peak of $KH*I$ at -1.5 ppm relative to TMS corresponding to an absolute resonance shift of -33.0 ppm matched the theoretical prediction of p = 2. The predicted catalyst reactions, position of the upfield-shifted NMR peaks, and spectroscopic data for $H^-(1/2)$ and $H^-(1/4)$ were found to be in agreement.

25. **R. L. Mills, P. Ray, B. Dhandapani, J. He, "Novel Liquid-Nitrogen-Condensable Molecular Hydrogen Gas", Polish Journal of Chemistry, submitted.**

Extreme ultraviolet (EUV) spectroscopy was recorded on microwave discharges of helium with 2% hydrogen. Novel emission lines were observed with energies of $q\cdot 13.6\,eV$ where $q=1,2,3,4,6,7,8,9,11$ or these discrete energies less $21.2\,eV$ corresponding to inelastic scattering of these photons by helium atoms due to excitation of $He(1s^2)$ to $He(1s^12p^1)$. These lines matched $H(1/p)$, fractional Rydberg states of atomic hydrogen, formed by a resonant nonradiative energy transfer to He^+. Corresponding emission due to the reaction $2H(1/2)\rightarrow H_2(1/2)$ with vibronic coupling at $E_{D+vib}=p^2E_{D\,H_2}\pm\left(\frac{\upsilon^*}{3}\right)E_{vib\,H_2(\upsilon=0\rightarrow\upsilon=1)}$, $\upsilon^*=1,2,3...$ was observed at the longer wavelengths for $\upsilon^*=2$ to $\upsilon^*=32$ and at the shorter wavelengths for $\upsilon^*=1$ to $\upsilon^*=16$ where $E_{D\,H_2}$ and $E_{vib\,H_2(\upsilon=0\rightarrow\upsilon=1)}$ are the experimental bond and vibrational energies of H_2, respectively. Fractional-principal-quantum-level molecular hydrogen $H_2(1/p)$ gas was isolated by liquefaction using an ultrahigh-vacuum, liquid nitrogen cryotrap and was characterized by gas chromatography (GC), mass spectroscopy (MS), optical emission spectroscopy (OES), and ^1H NMR (Rider University, Lawrenceville NJ) of the condensable gas dissolved in $CDCl_3$. The condensable gas was highly pure hydrogen by GC and MS and had a higher ionization energy than H_2. An upfield shifted NMR peak was observed at 3.25 ppm compared to that of H_2 at 4.63 ppm. A theoretical rocketry propellant reaction is given that may be transformational.

26. **R. L. Mills, J. Sankar, A. Voigt, J. He, B. Dhandapani, "Low Power MPCVD of Diamond Films on Silicon Substrates", Journal of Vacuum Science & Technology A, submitted.**

Polycrystalline diamond films were synthesized on silicon substrates for the first time without diamond seeding by a very low power (38 W) microwave plasma continuous vapor deposition (MPCVD) reaction of a mixture of 10-30% hydrogen, 90-70% helium, and 1-10% CH_4. The films were characterized by time of flight secondary ion mass spectroscopy (ToF-SIMS), X-ray photoelectron spectroscopy (XPS) (Zettlemoyer Center

for Surface Studies, Sinclair Laboratory, Lehigh University, Bethlehem, PA), Raman spectroscopy (Charles Evans & Associates, Sunnyvale, CA), scanning electron microscopy (SEM) (S. S. W., University of Western Ontario, Canada and Material Testing Laboratory, Pennington, NJ), and X-ray diffraction (XRD) (IC Laboratories, Amawalk, NY). It is proposed that He^+ served as a catalyst with atomic hydrogen to form an energetic plasma. The average hydrogen atom temperature was measured to be $180-210\,eV$ versus $\approx 3\,eV$ for pure hydrogen. The electron temperature T_e for helium-hydrogen was 28,000 K compared to 6800 K for pure helium. Bombardment of the carbon surface by highly energetic hydrogen formed by the catalysis reaction may play a role in the formation of diamond. Then, by this novel pathway, the relevance of the CO tie line is eliminated along with other stringent conditions and complicated and inefficient techniques which limit broad application of the versatility and superiority of diamond thin film technology.

27. **R. L. Mills, A. Voigt, B. Dhandapani, J. He, "Synthesis and Spectroscopic Identification of Lithium Chloro Hydride", Materials Characterization, submitted.**

A novel inorganic hydride compound, lithium chloro hydride ($LiHCl$), which comprises a high binding energy hydride ion was synthesized by reaction of atomic hydrogen with potassium metal and lithium chloride. Lithium chloro hydride was identified by time of flight secondary ion mass spectroscopy, X-ray photoelectron spectroscopy (Zettlemoyer Center for Surface Studies, Sinclair Laboratory, Lehigh University, Bethlehem, PA), ^1H nuclear magnetic resonance spectroscopy (Spectral Data Services, Inc., Champaign, IL), and powder X-ray diffraction (IC Laboratories, Amawalk, NY). Hydride ions with increased binding energies may form many novel compounds with broad applications such as the oxidant of a high voltage battery.

28. **R. L. Mills, J. Sankar, A. Voigt, J. He, B. Dhandapani, "Synthesis of HDLC Films from Solid Carbon", Thin Solid Films, submitted.**

A novel diamond-like carbon film terminated with $CH(1/p)$ (H^*DLC) comprising high binding energy hydride ions was synthesized from solid carbon by a microwave plasma reaction of a mixture of 10-30% hydrogen and 90-70% helium wherein it is proposed that He^+ served as a catalyst with atomic hydrogen to form the highly stable hydride ions. H^*DLC was identified by time of flight secondary ion mass spectroscopy (ToF-SIMS) and X-ray photoelectron spectroscopy (XPS) (Zettlemoyer Center for Surface Studies, Sinclair Laboratory, Lehigh University, Bethlehem, PA). TOF-SIMS identified the coatings as hydride by the large H^+ peak in the positive spectrum and the dominant H^- in the negative spectrum. The XPS identification of the H content of the CH coatings as hydride ion $H^-(1/10)$ corresponding to a peak at 49 eV has implications that the mechanism of the diamond-like carbon formation involves one or both of selective etching of graphitic carbon and the activation of surface carbon by the hydrogen catalysis product. Thus, a novel H intermediate formed by the plasma catalysis reaction may serve the role of H, oxygen species, CO, or halogen species

used in past systems. Bombardment of the diamond surface by observed, highly energetic species formed by the catalysis reaction may also play a role.

29. **R. L. Mills, A. Voigt, B. Dhandapani, J. He, "Synthesis and Characterization of Lithium Chloro Hydride", Int. J. Hydrogen Energy, submitted.**

A novel inorganic hydride compound lithium chloro hydride, $LiHCl$, which comprises a high binding energy hydride ion was synthesized by reaction of atomic hydrogen with potassium metal and lithium chloride. Lithium chloro hydride was identified by time of flight secondary ion mass spectroscopy, X-ray photoelectron spectroscopy (Zettlemoyer Center for Surface Studies, Sinclair Laboratory, Lehigh University, Bethlehem, PA), ^1H nuclear magnetic resonance spectroscopy (Spectral Data Services, Inc., Champaign, IL), and powder X-ray diffraction (IC Laboratories, Amawalk, NY). Hydride ions with increased binding energies may form many novel compounds with broad applications such as the oxidant of a high voltage battery.

I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

By _____

Dr. Randell L. Mills

Date: 8/15/03

94. R. L. Mills, "The Nature of the Chemical Bond Revisited and an Alternative Maxwellian Approach," J. Phys. D., submitted. (*Web Publication Date: Aug. 6, 2003.*)

93. R. L. Mills, P. Ray, M. Nansteel, J. He, X. Chen, A. Voigt, B. Dhandapani, "Energetic Catalyst-Hydrogen Plasma Reaction Forms a New State of Hydrogen," in preparation.

92. R. L. Mills, P. Ray, M. Nansteel, J. He, X. Chen, A. Voigt, B. Dhandapani, Luca Gamberale, "Energetic Catalyst-Hydrogen Plasma Reaction as a Potential New Energy Source," European Physical Journal D, submitted. (*Web Publication Date: June 6, 2003.*)

91. R. Mills, P. Ray, "New H I Laser Medium Based on Novel Energetic Plasma of Atomic Hydrogen and Certain Group I Catalysts," J. Plasma Physics, submitted.

90. R. L. Mills, P. Ray, M. Nansteel, J. He, X. Chen, A. Voigt, B. Dhandapani, "Characterization of Energetic Catalyst-Hydrogen Plasma Reaction as a Potential New Energy Source," Am. Chem. Soc. Div. Fuel Chem. Prepr., Vol. 48, No. 2, (2003).

89. R. Mills, P. C. Ray, R. M. Mayo, M. Nansteel, W. Good, P. Jansson, B. Dhandapani, J. He, "Hydrogen Plasmas Generated Using Certain Group I Catalysts Show Stationary Inverted Lyman Populations and Free-Free and Bound-Free Emission of Lower-Energy State Hydride," Technical Physics, submitted.

88. R. Mills, J. Sankar, A. Voigt, J. He, P. Ray, B. Dhandapani, "Role of Atomic Hydrogen Density and Energy in Low Power CVD Synthesis of Diamond Films," JACS, in preparation.

87. R. Mills, B. Dhandapani, M. Nansteel, J. He, P. Ray, "Liquid-Nitrogen-Condensable Molecular Hydrogen Gas Isolated from a Catalytic Plasma Reaction," J. Phys. Chem. B, submitted.

86. R. L. Mills, P. Ray, J. He, B. Dhandapani, M. Nansteel, "Novel Spectral Series from Helium-Hydrogen Evenson Microwave Cavity Plasmas that Matched Fractional-Principal-Quantum-Energy-Level Atomic and Molecular Hydrogen," European Journal of Physics, submitted. (*Web Publication Date: April 24, 2003.*)

85. R. L. Mills, P. Ray, R. M. Mayo, "Highly Pumped Inverted Balmer and Lyman Populations," New Journal of Physics, submitted.

84. R. L. Mills, P. Ray, J. Dong, M. Nansteel, R. M. Mayo, B. Dhandapani, X. Chen, "Comparison of Balmer α Line Broadening and Power Balances of Helium-Hydrogen Plasma Sources," Plasma Sources Science and Technology, submitted. (*Web Publication Date: March 12, 2003.*)

83. R. Mills, P. Ray, M. Nansteel, R. M. Mayo, "Comparison of Water-Plasma Sources of Stationary Inverted Balmer and Lyman Populations for a CW HI Laser," J. Appl. Spectroscopy, in preparation.

82. R. Mills, J. Sankar, P. Ray, J. He, A. Voigt, B. Dhandapani, "Synthesis and Characterization of Diamond Films from MPCVD of an Energetic Argon-Hydrogen Plasma and Methane," Materials Science, submitted. (*Web Publication Date: May 7, 2003.*)

81. R. Mills, P. Ray, B. Dhandapani, W. Good, P. Jansson, M. Nansteel, J. He, A. Voigt, "Spectroscopic and NMR Identification of Novel Hydride Ions in Fractional Quantum Energy States Formed by an Exothermic Reaction of Atomic Hydrogen with Certain Catalysts," European Physical Journal: Applied Physics,

submitted. (*Web Publication Date: Feb. 21, 2003.*)

80. R. L. Mills, "The Fallacy of Feynman's Argument on the Stability of the Hydrogen Atom According to Quantum Mechanics," Foundations of Phys., submitted. (*Web Publication Date: Jan. 27, 2003.*)
79. R. Mills, J. He, B. Dhandapani, P. Ray, "Comparison of Catalysts and Microwave Plasma Sources of Vibrational Spectral Emission of Fractional-Rydberg-State Hydrogen Molecular Ion," Canadian Journal of Physics, submitted.
78. R. L. Mills, P. Ray, X. Chen, B. Dhandapani, "Vibrational Spectral Emission of Fractional-Principal-Quantum-Energy-Level Molecular Hydrogen", J. of the Physical Society of Japan, submitted. (*Web Publication Date: Sept. 9, 2002.*)
77. J. Phillips, R. L. Mills, X. Chen, "Water Bath Calorimetric Study of Excess Heat in 'Resonance Transfer' Plasmas," Journal of Applied Physics, submitted. (*Web Publication Date: June 16, 2003.*)
76. R. L. Mills, P. Ray, B. Dhandapani, X. Chen, "Comparison of Catalysts and Microwave Plasma Sources of Spectral Emission of Fractional-Principal-Quantum-Energy-Level Atomic and Molecular Hydrogen," Journal of Applied Spectroscopy, submitted. (*Web Publication Date: Feb. 12, 2002.*)
75. R. L. Mills, P. Ray, B. Dhandapani, J. He, "Novel Liquid-Nitrogen-Condensable Molecular Hydrogen Gas," Acta Physica Polonica A, submitted. (*Web Publication Date: Oct. 29, 2002.*)
74. R. L. Mills, P. C. Ray, R. M. Mayo, M. Nansteel, B. Dhandapani, J. Phillips, "Spectroscopic Study of Unique Line Broadening and Inversion in Low Pressure Microwave Generated Water Plasmas," Physics of Plasmas, submitted. (*Web Publication Date: June 18, 2003.*)
73. R. L. Mills, P. Ray, B. Dhandapani, J. He, "Energetic Helium-Hydrogen Plasma Reaction," AIAA Journal, submitted. (*Web Publication Date: July 26, 2002.*)
72. R. L. Mills, M. Nansteel, P. C. Ray, "Bright Hydrogen-Light and Power Source due to a Resonant Energy Transfer with Strontium and Argon Ions," Vacuum, submitted.
71. R. L. Mills, P. Ray, B. Dhandapani, J. Dong, X. Chen, "Power Source Based on Helium-Plasma Catalysis of Atomic Hydrogen to Fractional Rydberg States," Contributions to Plasma Physics, submitted.
70. R. Mills, J. He, A. Echezuria, B Dhandapani, P. Ray, "Comparison of Catalysts and Plasma Sources of Vibrational Spectral Emission of Fractional-Rydberg-State Hydrogen Molecular Ion," European Journal of Physics D, submitted. (*Web Publication Date: Sept. 2, 2002.*)
69. R. L. Mills, J. Sankar, A. Voigt, J. He, B. Dhandapani, "Spectroscopic Characterization of the Atomic Hydrogen Energies and Densities and Carbon Species During Helium-Hydrogen-Methane Plasma CVD Synthesis of Diamond Films," Chemistry of Materials, Vol. 15, (2003), pp. 1313–1321. (*Web Publication Date: Dec. 31, 2002.*)
68. R. Mills, P. Ray, R. M. Mayo, "Stationary Inverted Balmer and Lyman Populations for a CW HI Water-Plasma Laser," IEEE Transactions on Plasma Science, submitted. (*Web Publication Date: Aug. 16, 2002.*)
67. R. L. Mills, P. Ray, B. Dhandapani, J. He, "Extreme Ultraviolet Spectroscopy of Helium-Hydrogen Plasma,"

J. Phys. D, Vol. 36, (2003), pp. 1535–1542. (*Web Publication Date: July 17, 2002.*)

66. R. L. Mills, P. Ray, "Spectroscopic Evidence for a Water-Plasma Laser," Europhysics Letters, submitted. (*Web Publication Date: Sept. 19, 2002.*)
65. R. Mills, P. Ray, R. M. Mayo, "Spectroscopic Evidence for CW H I Lasing in a Water-Plasma," J. of Applied Physics, submitted. (*Web Publication Date: Sept. 18, 2002.*)
64. R. L. Mills, J. Sankar, A. Voigt, J. He, B. Dhandapani, "Low Power MPCVD of Diamond Films on Silicon Substrates," Journal of Vacuum Science & Technology A, submitted. (*Web Publication Date: June 26, 2002.*)
63. R. L. Mills, X. Chen, P. Ray, J. He, B. Dhandapani, "Plasma Power Source Based on a Catalytic Reaction of Atomic Hydrogen Measured by Water Bath Calorimetry," Thermochimica Acta, in press. (*Web Publication Date: June 25, 2002.*)
62. R. L. Mills, A. Voigt, B. Dhandapani, J. He, "Synthesis and Spectroscopic Identification of Lithium Chloro Hydride," Materials Characterization, submitted.
61. R. L. Mills, B. Dhandapani, J. He, "Highly Stable Amorphous Silicon Hydride," Solar Energy Materials & Solar Cells, in press. (*Web Publication Date: April 15, 2002.*)
60. R. L. Mills, J. Sankar, A. Voigt, J. He, B. Dhandapani, "Synthesis of HDLC Films from Solid Carbon," Journal of Material Science, submitted. (*Web Publication Date: May 3, 2002.*)
59. R. Mills, P. Ray, R. M. Mayo, "The Potential for a Hydrogen Water-Plasma Laser," Applied Physics Letters, Vol. 82, No. 11, (2003), pp. 1679–1681. (*Web Publication Date: July 11, 2002.*)
58. R. L. Mills, "Classical Quantum Mechanics," Physics Essays, submitted. (*Web Publication Date: May 23, 2002.*)
57. R. L. Mills, P. Ray, "Spectroscopic Characterization of Stationary Inverted Lyman Populations and Free-Free and Bound-Free Emission of Lower-Energy State Hydride Ion Formed by a Catalytic Reaction of Atomic Hydrogen and Certain Group I Catalysts, Quantitative Spectroscopy and Radiative Transfer, No. 39, sciencedirect.com, April 17, (2003).
56. R. M. Mayo, R. Mills, "Direct Plasmadynamic Conversion of Plasma Thermal Power to Electricity for Microdistributed Power Applications," 40th Annual Power Sources Conference, Cherry Hill, NJ, June 10-13, (2002), pp. 1–4. (*Web Publication Date: March 28, 2002.*)
55. R. Mills, P. Ray, R. M. Mayo, "Chemically-Generated Stationary Inverted Lyman Population for a CW HI Laser," European J of Phys. D, submitted. (*Web Publication Date: April 22, 2002.*)
54. R. L. Mills, P. Ray, "Stationary Inverted Lyman Population Formed from Incandescently Heated Hydrogen Gas with Certain Catalysts," J. Phys. D, Applied Physics, Vol. 36, (2003), pp. 1504–1509. (*Web Publication Date: March 20, 2002.*)
53. R. Mills, "A Maxwellian Approach to Quantum Mechanics Explains the Nature of Free Electrons in Superfluid Helium," International Journal of Theoretical Physics, submitted. (*Web Publication Date: June 4,*

2002.)

52. R. Mills and M. Nansteel, P. Ray, "Bright Hydrogen-Light Source due to a Resonant Energy Transfer with Strontium and Argon Ions," New Journal of Physics, Vol. 4, (2002), pp. 70.1–70.28. (*Web Publication Date: October, 2002, when it became available on the New Journal of Physics website.*)
51. R. Mills, P. Ray, R. M. Mayo, "CW HI Laser Based on a Stationary Inverted Lyman Population Formed from Incandescently Heated Hydrogen Gas with Certain Group I Catalysts," IEEE Transactions on Plasma Science, Vol. 31, No. 2, (2003), pp. 236–247. (*Web Publication Date: Feb. 4, 2002.*)
50. R. L. Mills, P. Ray, J. Dong, M. Nansteel, B. Dhandapani, J. He, "Spectral Emission of Fractional-Principal-Quantum-Energy-Level Atomic and Molecular Hydrogen," Vibrational Spectroscopy, Vol. 31, No. 2, (2003), pp. 195–213.
49. R. L. Mills, P. Ray, E. Dayalan, B. Dhandapani, J. He, "Comparison of Excessive Balmer α Line Broadening of Inductively and Capacitively Coupled RF, Microwave, and Glow Discharge Hydrogen Plasmas with Certain Catalysts," IEEE Transactions on Plasma Science, Vol. 31, No. 3, (2003), pp. 338–355. (*Web Publication Date: Sept. 17, 2002.*)
48. R. M. Mayo, R. Mills, M. Nansteel, "Direct Plasmadynamic Conversion of Plasma Thermal Power to Electricity," IEEE Transactions on Plasma Science, October, (2002), Vol. 30, No. 5, pp. 2066–2073. (*Web Publication Date: March 26, 2002.*)
47. H. Conrads, R. Mills, Th. Wrubel, "Emission in the Deep Vacuum Ultraviolet from a Plasma Formed by Incandescently Heating Hydrogen Gas with Trace Amounts of Potassium Carbonate," Plasma Sources Science and Technology, Vol 12, (2003), pp. 389–395.
46. R. L. Mills, P. Ray, "Stationary Inverted Lyman Population and a Very Stable Novel Hydride Formed by a Catalytic Reaction of Atomic Hydrogen and Certain Catalysts," Physica B, submitted.
45. R. L. Mills, J. He, P. Ray, B. Dhandapani, X. Chen, "Synthesis and Characterization of a Highly Stable Amorphous Silicon Hydride as the Product of a Catalytic Helium-Hydrogen Plasma Reaction," Int. J. Hydrogen Energy, Vol. 28, No. 12, (2003), pp. 1401–1424. (*Web Publication Date: April 15, 2002.*)
44. R. L. Mills, A. Voigt, B. Dhandapani, J. He, "Synthesis and Characterization of Lithium Chloro Hydride," Int. J. Hydrogen Energy, submitted. (*Web Publication Date: Jan. 7, 2002.*)
43. R. L. Mills, P. Ray, "Substantial Changes in the Characteristics of a Microwave Plasma Due to Combining Argon and Hydrogen," New Journal of Physics, www.njp.org, Vol. 4, (2002), pp. 22.1–22.17. (*Web Publication Date: Dec. 27, 2001.*)
42. R. L. Mills, P. Ray, "A Comprehensive Study of Spectra of the Bound-Free Hyperfine Levels of Novel Hydride Ion $H^-(1/2)$, Hydrogen, Nitrogen, and Air," Int. J. Hydrogen Energy, Vol. 28, No. 8, (2003), pp. 825–871. (*Web Publication Date: Nov. 14, 2001.*)
41. R. L. Mills, E. Dayalan, "Novel Alkali and Alkaline Earth Hydrides for High Voltage and High Energy Density Batteries," Proceedings of the 17th Annual Battery Conference on Applications and Advances, California

State University, Long Beach, CA, (January 15-18, 2002), pp. 1–6. (*Web Publication Date: Nov. 9, 2001.*)

40. R. M. Mayo, R. Mills, M. Nansteel, "On the Potential of Direct and MHD Conversion of Power from a Novel Plasma Source to Electricity for Microdistributed Power Applications," IEEE Transactions on Plasma Science, August, (2002), Vol. 30, No. 4, pp. 1568–1578. (*Web Publication Date: Nov. 12, 2001.*)
39. R. Mills, P. C. Ray, R. M. Mayo, M. Nansteel, W. Good, P. Jansson, B. Dhandapani, J. He, "Stationary Inverted Lyman Populations and Free-Free and Bound-Free Emission of Lower-Energy State Hydride Ion Formed by an Exothermic Catalytic Reaction of Atomic Hydrogen and Certain Group I Catalysts," J. Phys. Chem. A, submitted. (*Web Publication Date: Nov. 13, 2001.*)
38. R. Mills, E. Dayalan, P. Ray, B. Dhandapani, J. He, "Highly Stable Novel Inorganic Hydrides from Aqueous Electrolysis and Plasma Electrolysis," Electrochimica Acta, Vol. 47, No. 24, (2002), pp. 3909–3926. (*Web Publication Date: June 13, 2002.*)
37. R. L. Mills, P. Ray, B. Dhandapani, R. M. Mayo, J. He, "Comparison of Excessive Balmer α Line Broadening of Glow Discharge and Microwave Hydrogen Plasmas with Certain Catalysts," J. of Applied Physics, (2002), Vol. 92, No. 12, pp. 7008–7022. (*Web Publication Date: Oct. 9, 2002.*)
36. R. L. Mills, P. Ray, B. Dhandapani, J. He, "Emission Spectroscopic Identification of Fractional Rydberg States of Atomic Hydrogen Formed by a Catalytic Helium-Hydrogen Plasma Reaction," Vacuum, submitted. (*Web Publication Date: Oct. 9, 2001.*)
35. R. L. Mills, P. Ray, B. Dhandapani, M. Nansteel, X. Chen, J. He, "New Power Source from Fractional Rydberg States of Atomic Hydrogen," Current Appl. Phys., submitted. (*Web Publication Date: Oct. 9, 2001.*)
34. R. L. Mills, P. Ray, B. Dhandapani, M. Nansteel, X. Chen, J. He, "Spectroscopic Identification of Transitions of Fractional Rydberg States of Atomic Hydrogen," J. of Quantitative Spectroscopy and Radiative Transfer, in press. (*Web Publication Date: Oct. 9, 2001.*)
33. R. L. Mills, P. Ray, B. Dhandapani, M. Nansteel, X. Chen, J. He, "New Power Source from Fractional Quantum Energy Levels of Atomic Hydrogen that Surpasses Internal Combustion," J Mol. Struct., Vol. 643, No. 1-3, (2002), pp. 43–54. (*Web Publication Date: Oct. 10, 2001.*)
32. R. L. Mills, P. Ray, "Spectroscopic Identification of a Novel Catalytic Reaction of Rubidium Ion with Atomic Hydrogen and the Hydride Ion Product," Int. J. Hydrogen Energy, Vol. 27, No. 9, (2002), pp. 927–935. (*Web Publication Date: Sept. 19, 2001.*)
31. R. Mills, J. Dong, W. Good, P. Ray, J. He, B. Dhandapani, "Measurement of Energy Balances of Noble Gas-Hydrogen Discharge Plasmas Using Calvet Calorimetry," Int. J. Hydrogen Energy, Vol. 27, No. 9, (2002), pp. 967–978. (*Web Publication Date: Sept. 14, 2001.*)
30. R. L. Mills, A. Voigt, P. Ray, M. Nansteel, B. Dhandapani, "Measurement of Hydrogen Balmer Line Broadening and Thermal Power Balances of Noble Gas-Hydrogen Discharge Plasmas," Int. J. Hydrogen Energy, Vol. 27, No. 6, (2002), pp. 671–685. (*Web Publication Date: Aug. 22, 2001.*)
29. R. Mills, P. Ray, "Vibrational Spectral Emission of Fractional-Principal-Quantum-Energy-Level Hydrogen

Molecular Ion," Int. J. Hydrogen Energy, Vol. 27, No. 5, (2002), pp. 533–564. (*Web Publication Date: July 19, 2001.*)

28. R. Mills, P. Ray, "Spectral Emission of Fractional Quantum Energy Levels of Atomic Hydrogen from a Helium-Hydrogen Plasma and the Implications for Dark Matter," Int. J. Hydrogen Energy, (2002), Vol. 27, No. 3, pp. 301–322. (*Web Publication Date: Aug. 1, 2001.*)
27. R. Mills, P. Ray, "Spectroscopic Identification of a Novel Catalytic Reaction of Potassium and Atomic Hydrogen and the Hydride Ion Product," Int. J. Hydrogen Energy, Vol. 27, No. 2, (2002), pp. 183–192. (*Web Publication Date: Jan. 11, 2002.*)
26. R. Mills, "BlackLight Power Technology-A New Clean Hydrogen Energy Source with the Potential for Direct Conversion to Electricity," Proceedings of the National Hydrogen Association, 12 th Annual U.S. Hydrogen Meeting and Exposition, *Hydrogen: The Common Thread*, The Washington Hilton and Towers, Washington DC, (March 6-8, 2001), pp. 671–697. (*Presented at the conference on March 7, 2001; Web Publication Date: April 20, 2001.*)
25. R. Mills, W. Good, A. Voigt, Jinquan Dong, "Minimum Heat of Formation of Potassium Iodo Hydride," Int. J. Hydrogen Energy, Vol. 26, No. 11, (2001), pp. 1199–1208. (*Web Publication Date: March 23, 2001.*)
24. R. Mills, "Spectroscopic Identification of a Novel Catalytic Reaction of Atomic Hydrogen and the Hydride Ion Product," Int. J. Hydrogen Energy, Vol. 26, No. 10, (2001), pp. 1041–1058. (*Web Publication Date: March 23, 2001.*)
23. R. Mills, N. Greenig, S. Hicks, "Optically Measured Power Balances of Glow Discharges of Mixtures of Argon, Hydrogen, and Potassium, Rubidium, Cesium, or Strontium Vapor," Int. J. Hydrogen Energy, Vol. 27, No. 6, (2002), pp. 651–670. (*Web Publication Date: July 20, 2001.*)
22. R. Mills, "The Grand Unified Theory of Classical Quantum Mechanics," Global Foundation, Inc. Orbis Scientiae entitled *The Role of Attractive and Repulsive Gravitational Forces in Cosmic Acceleration of Particles The Origin of the Cosmic Gamma Ray Bursts*, (29th Conference on High Energy Physics and Cosmology Since 1964) Dr. Behram N. Kursunoglu, Chairman, December 14-17, 2000, Lago Mar Resort, Fort Lauderdale, FL, Kluwer Academic/Plenum Publishers, New York, pp. 243–258. (*Presented at the conference on Dec. 15, 2000; Web Publication Date: May 17, 2001.*)
21. R. Mills, "The Grand Unified Theory of Classical Quantum Mechanics," Int. J. Hydrogen Energy, Vol. 27, No. 5, (2002), pp. 565–590. (*Web Publication Date: Sept. 17, 2001.*)
20. R. Mills and M. Nansteel, P. Ray, "Argon-Hydrogen-Strontium Discharge Light Source," IEEE Transactions on Plasma Science, Vol. 30, No. 2, (2002), pp. 639–653. (*Web Publication Date: Dec. 7, 2000.*)
19. R. Mills, B. Dhandapani, M. Nansteel, J. He, A. Voigt, "Identification of Compounds Containing Novel Hydride Ions by Nuclear Magnetic Resonance Spectroscopy," Int. J. Hydrogen Energy, Vol. 26, No. 9, (2001), pp. 965–979. (*Web Publication Date: March 22, 2001.*)
18. R. Mills, "BlackLight Power Technology-A New Clean Energy Source with the Potential for Direct

Conversion to Electricity," Global Foundation International Conference on "Global Warming and Energy Policy," Dr. Behram N. Kursunoglu, Chairman, Fort Lauderdale, FL, November 26-28, 2000, Kluwer Academic/Plenum Publishers, New York, pp. 187–202. (*Presented at the conference on Nov. 26, 2000; Web Publication Date: Jan. 19, 2001.*)

17. R. Mills, "The Nature of Free Electrons in Superfluid Helium—a Test of Quantum Mechanics and a Basis to Review its Foundations and Make a Comparison to Classical Theory," Int. J. Hydrogen Energy, Vol. 26, No. 10, (2001), pp. 1059–1096. (*Web Publication Date: Dec. 11, 2000.*)
16. R. Mills, M. Nansteel, and Y. Lu, "Excessively Bright Hydrogen-Strontium Plasma Light Source Due to Energy Resonance of Strontium with Hydrogen," J. of Plasma Physics, Vol. 69, (2003), pp. 131–158. (*Web Publication Date: Aug. 27, 2001.*)
15. R. Mills, J. Dong, Y. Lu, "Observation of Extreme Ultraviolet Hydrogen Emission from Incandescently Heated Hydrogen Gas with Certain Catalysts," Int. J. Hydrogen Energy, Vol. 25, (2000), pp. 919–943. (*Web Publication Date: June 27, 2000.*)
14. R. Mills, "Observation of Extreme Ultraviolet Emission from Hydrogen-KI Plasmas Produced by a Hollow Cathode Discharge," Int. J. Hydrogen Energy, Vol. 26, No. 6, (2001), pp. 579–592. (*Web Publication Date: July 10, 2000.*)
13. R. Mills, "Temporal Behavior of Light-Emission in the Visible Spectral Range from a Ti-K2CO3-H-Cell," Int. J. Hydrogen Energy, Vol. 26, No. 4, (2001), pp. 327–332. (*Web Publication Date: July 10, 2000.*)
12. R. Mills, T. Onuma, and Y. Lu, "Formation of a Hydrogen Plasma from an Incandescently Heated Hydrogen-Catalyst Gas Mixture with an Anomalous Afterglow Duration," Int. J. Hydrogen Energy, Vol. 26, No. 7, July, (2001), pp. 749–762. (*Web Publication Date: June 28, 2000.*)
11. R. Mills, M. Nansteel, and Y. Lu, "Observation of Extreme Ultraviolet Hydrogen Emission from Incandescently Heated Hydrogen Gas with Strontium that Produced an Anomalous Optically Measured Power Balance," Int. J. Hydrogen Energy, Vol. 26, No. 4, (2001), pp. 309–326. (*Web Publication Date: June 27, 2000.*)
10. R. Mills, B. Dhandapani, N. Greenig, J. He, "Synthesis and Characterization of Potassium Iodo Hydride," Int. J. of Hydrogen Energy, Vol. 25, Issue 12, December, (2000), pp. 1185–1203. (*Web Publication Date: Nov. 12, 2001.*)
9. R. Mills, "Novel Inorganic Hydride," Int. J. of Hydrogen Energy, Vol. 25, (2000), pp. 669–683. (*Web Publication Date: June 28, 2000.*)
8. R. Mills, B. Dhandapani, M. Nansteel, J. He, T. Shannon, A. Echezuria, "Synthesis and Characterization of Novel Hydride Compounds," Int. J. of Hydrogen Energy, Vol. 26, No. 4, (2001), pp. 339–367. (*Web Publication Date: June 13, 2001.*)
7. R. Mills, "Highly Stable Novel Inorganic Hydrides," Journal of New Materials for Electrochemical Systems, Vol. 6, (2003), pp. 45–54. (*Web Publication Date: Nov. 20, 2001.*)

6. R. Mills, "Novel Hydrogen Compounds from a Potassium Carbonate Electrolytic Cell," Fusion Technology, Vol. 37, No. 2, March, (2000), pp. 157–182. (*Web Publication Date: June 26, 2000.*)

5. R. Mills, "The Hydrogen Atom Revisited," Int. J. of Hydrogen Energy, Vol. 25, Issue 12, December, (2000), pp. 1171–1183. (*Web Publication Date: June 27, 2000.*)

4. Mills, R., Good, W., "Fractional Quantum Energy Levels of Hydrogen," Fusion Technology, Vol. 28, No. 4, November, (1995), pp. 1697–1719. (*Web Publication Date: Nov. 1, 2001.*)

3. Mills, R., Good, W., Shaubach, R., "Dihydrino Molecule Identification," Fusion Technology, Vol. 25, 103 (1994). (*Web Publication Date: April 11, 2001.*)

2. R. Mills and S. Kneizys, Fusion Technol. Vol. 20, 65 (1991). (*Web Publication Date: April 11, 2001.*)

1. R. Mills, *The Grand Unified Theory of Classical Quantum Mechanics*, September 2001 Edition, BlackLight Power, Inc., Cranbury, New Jersey, Distributed by Amazon.com; July 2003 Edition posted at www.blacklightpower.com.

Book Publications

8. R. Mills, *The Grand Unified Theory of Classical Quantum Mechanics*, January 2003 Edition, BlackLight Power, Inc., Cranbury, New Jersey, posted at www.blacklightpower.com.

7. R. Mills, *The Grand Unified Theory of Classical Quantum Mechanics*, September 2001 Edition, BlackLight Power, Inc., Cranbury, New Jersey, Distributed by Amazon.com.

6. R. Mills, *The Grand Unified Theory of Classical Quantum Mechanics*, January 2000 Edition, BlackLight Power, Inc., Cranbury, New Jersey

5. R. Mills, *The Grand Unified Theory of Classical Quantum Mechanics*, January 1999 Edition.

4. R. Mills, *The Grand Unified Theory of Classical Quantum Mechanics*, September 1996 Edition.

3. R. Mills, *The Grand Unified Theory of Classical Quantum Mechanics*, (1995), Technomic Publishing Company, Lancaster, PA provided by HydroCatalysis Power Corporation, Great Valley Corporate Center, 41 Great Valley Parkway, Malvern, PA 19355

2. R. Mills, *The Unification of Spacetime, the Forces, Matter, and Energy*, Technomic Publishing Company, Lancaster, PA, (1992).

1. R. Mills, J. Farrell, *The Grand Unified Theory*, Science Press, Ephrata, PA, (1990).

Correspondence

5. R. Mills, "One Dimension Gravity Well—A Flawed Interpretation," response to V. V. Nesvizhevsky , Scientific American, submitted.

4. R. Mills, Response to W. Seifritz, Int J of Hydrogen Energy, Vol. 28, No. 3, (2003), pp. 359-360.

3. R. Mills, Response to T. Ohta, Int J of Hydrogen Energy, Vol. 26, No. 11, (2001), pp. 1225.

2. R. Mills, Response to I Shechtman, Int J of Hydrogen Energy, Vol. 26, No. 11, (2001), pp. 1229–1231.

1. R. Mills, Response to A, K. Vijh, Int J of Hydrogen Energy, Vol. 26, No. 11, (2001), pp. 1233.

Test Reports

Numerous test reports are available from BlackLight Power (e.g. Haldeman, C. W., Savoye, G. W., Iseler, G. W., Clark, H. R., MIT Lincoln Laboratories Excess Energy Cell Final report ACC Project 174 (3), April 25, 1995; Peterson, S., H., Evaluation of Heat Production from Light Water Electrolysis Cells of HydroCatalysis Power Corporation, Report from Westinghouse STC, 1310 Beulah Road, Pittsburgh, PA, February 25, 1994; Craw-Ivanco, M. T.; Tremblay, R. P.; Boniface, H. A.; Hilborn, J. W.; "Calorimetry for a Ni/K_2CO_3 Cell," Atomic Energy Canada Limited, Chemical Engineering Branch, Chalk River Laboratories, Chalk River, Ontario, June 1994; Nesterov, S. B., Kryukov, A. P., Moscow Power Engineering Institute Affidavit, February, 26,1993; Jacox, M. G., Watts, G. R., "The Search for Excess Heat in the Mills Electrolytic Cell," Idaho National Engineering Laboratory, EG&G Idaho, Inc., Idaho Falls, Idaho, 83415, January 7, 1993; Gernert, N., Shaubach, R. M., Mills, R., Good, W., "Nascent Hydrogen: An Energy Source," Final Report prepared by Thermacore, Inc., for the Aero Propulsion and Power Directorate, Wright Laboratory, Air Force Material Command (ASC), Wright-Patterson Air Force Base, Contract Number F33615-93-C-2326, May, (1994); Phillips, J., Smith, J., Kurtz, S., "Report On Calorimetric Investigations Of Gas-Phase Catalyzed Hydrino Formation" Final report for Period October-December 1996," January 1, 1997, A Confidential Report submitted to BlackLight Power, Inc. provided by BlackLight Power, Inc., Great Valley Corporate Center, 41 Great Valley Parkway, Malvern, PA 19355; B. N. Popov, "Electrochemical Characterization of BlackLight Power, Inc. MH as Electrodes for Li-ion Batteries, Dept. of Chemical Engineering, University of South Carolina, February 6, 2000; Scores of Independent Tests of BlackLight Power's Novel Hydride Compounds from over 20 Independent Testing Laboratories.)

Upcoming Conference Presentations

50. R. L. Mills, P. Ray, M. Nansteel, J. He, X. Chen, A. Voigt, B. Dhandapani, "Energetic Catalyst-Hydrogen Plasma Reaction as a Potential New Energy Source", (Fuel Chemistry Symposium), Am. Chem. Soc. Oral Presentation, 226th ACS National Meeting, (Sept. 7-11, 2003), New York, NY.

Prior Conference Presentations

49. B. Dhandapani, R. Mills, "Novel Liquid-Nitrogen-Condensable Molecular Hydrogen Gas" (Physical

Chemistry Session) , Wednesday, June 11, 2003, 36th Middle Atlantic Regional Meeting of American Chemical Society, (June 8–11, 2003), Princeton University, Princeton, NJ.

48. P. Ray, R. Mills, "Extreme Ultraviolet Spectroscopy of Helium-Hydrogen Plasma" (Physical Chemistry Session) , Wednesday, June 11, 2003, 36th Middle Atlantic Regional Meeting of American Chemical Society, (June 8–11, 2003), Princeton University, Princeton, NJ.
47. R. Mills, "Novel Catalytic Reaction Of Hydrogen as a Potential New Energy Source" (Catalysis Session), Tuesday, June 10, 2003, 36th Middle Atlantic Regional Meeting of American Chemical Society, (June 8–11, 2003), Princeton University, Princeton, NJ.
46. J. He, R. Mills, "TOF-SIMS and XPS Studies of Highly Stable Silicon Hydride Films" (Inorganic/Solid State Session), Monday, June 9, 2003, 36th Middle Atlantic Regional Meeting of American Chemical Society, (June 8–11, 2003), Princeton University, Princeton, NJ.
45. B. Dhandapani, R. Mills, "Low Power MPCVD Synthesis and Characterization of Diamond Films on Silicon Substrates" (Inorganic/Solid State Session) , Monday, June 9, 2003, 36th Middle Atlantic Regional Meeting of American Chemical Society, (June 8–11, 2003), Princeton University, Princeton, NJ.
44. X. Chen, R. Mills, "Calorimetric Study of Heat Generation by Catalytic Reaction of Atomic Hydrogen in Resonant Transfer Plasmas" (Fuel Cells Session) , Monday, June 9, 2003, 36th Middle Atlantic Regional Meeting of American Chemical Society, (June 8–11, 2003), Princeton University, Princeton, NJ.
43. R. L. Mills, "Novel Catalytic Reaction of Hydrogen as a Potential New Energy Source", Division of Industrial and Engineering Chemistry, "Green Chemistry in the Design of Alternative Energy Strategies", symposium, Oral Presentation, 225th ACS National Meeting, (March 23-27, 2003), New Orleans, LA.
42. R. L. Mills, "Novel Catalytic Reaction of Hydrogen as a Potential New Energy Source," Monday, November 25, Room 216, Protocol Center, TA-3, Los Alamos National Laboratory.
41. R. L. Mills, "Classical Quantum Mechanics," Monday, November 25, Room 216, Protocol Center, TA-3, Los Alamos National Laboratory.
40. R. L. Mills, Seminar: "Novel Catalytic Reaction of Hydrogen as a Potential New Energy Source," US Environmental Protection Agency, National Risk Management Research Laboratory, Sustainable Technologies Division, Cincinnati, OH, October 24, 2002.
39. R. L. Mills, J. Dong, J. He, B. Dhandapani, A. Voigt, M. Nansteel, J. Sankar, R. M. Mayo, P. Ray, "Novel Catalytic Reaction of Hydrogen as a Potential New Energy Source," Division of Inorganic Chemistry, Oral Presentation, 224rd ACS National Meeting, (August 18-22, 2002), Boston, MA (Aug. 22, 4:10-4:30 PM).
38. R. L. Mills, J. Dong, J. He, B. Dhandapani, A. Voigt, M. Nansteel, J. Sankar, R. M. Mayo, P. Ray, "Novel Catalytic Reaction of Hydrogen as a Potential New Energy Source," Division of Colloidal and Surface Chemistry, Oral Presentation, 224rd ACS National Meeting, (August 18-22, 2002), Boston, MA (Aug. 22, 8:30-8:50 AM).
37. P. Ray, R. Mills, "Spectroscopic Characterization of Stationary Inverted Balmer and Lyman Populations

Formed by a Catalytic Reaction of Atomic Hydrogen with Oxygen and with Certain Group I Catalysts," Eighteenth International Conference on Atomic Physics, July 28-August 2, 2002, Cambridge, Massachusetts.

36. R. M. Mayo, R. L. Mills, M. Nansteel, "Direct Plasmadynamic Conversion of Plasma Thermal Power from a Novel Plasma Source to Electricity for Microdistributed Power Applications," 40th Power Sources Conference, (June 6–13, 2002), Cherry Hill, NJ.
35. R. L. Mills, J. Dong, J. He, B. Dhandapani, W. Good, A. Voigt, S. Hicks, M. Nansteel, E. Dayalan, P. Ray, "Spectroscopic Identification of a Novel Catalytic Reaction of Hydrogen," Division of Inorganic Chemistry, Oral Presentation, 223rd ACS National Meeting, (April 7–11, 2002), Orlando, FL.
34. R. L. Mills, J. Dong, J. He, B. Dhandapani, W. Good, A. Voigt, S. Hicks, M. Nansteel, E. Dayalan, P. Ray, "Novel Catalytic Reaction of Hydrogen as a Potential New Energy Source," Division of Inorganic Chemistry, Oral Presentation, 223rd ACS National Meeting, (April 7–11, 2002), Orlando, FL.
33. R. L. Mills, J. Dong, J. He, B. Dhandapani, W. Good, A. Voigt, S. Hicks, M. Nansteel, E. Dayalan, P. Ray, "Novel Catalytic Reaction of Hydrogen as a Potential New Energy Source," Division of Industrial and Engineering Chemistry, Oral Presentation, 223rd ACS National Meeting, (April 7–11, 2002), Orlando, FL.
32. R. L. Mills, J. Dong, J. He, B. Dhandapani, W. Good, A. Voigt, S. Hicks, M. Nansteel, E. Dayalan, P. Ray, "Novel Catalytic Reaction of Hydrogen as a Potential New Energy Source," Catalysis and Surface Science Secretariat, Oral Presentation, 223rd ACS National Meeting, (April 7–11, 2002), Orlando, FL.
31. R. L. Mills, J. Dong, J. He, B. Dhandapani, W. Good, A. Voigt, S. Hicks, M. Nansteel, E. Dayalan, P. Ray, "Novel Catalytic Reaction of Hydrogen as a Potential New Energy Source," Division of Physical Chemistry, Poster Presentation, 223rd ACS National Meeting, (April 7–11, 2002), Orlando, FL.
30. R. L. Mills, J. Dong, J. He, B. Dhandapani, W. Good, A. Voigt, S. Hicks, M. Nansteel, E. Dayalan, P. Ray, "Novel Catalytic Reaction of Hydrogen as a Potential New Energy Source," Division of Physical Chemistry, Sci-Mix Poster Presentation, 223rd ACS National Meeting, (April 7–11, 2002), Orlando, FL.
29. R. Mills, "BlackLight Power Technology-A New Clean Energy Source with the Potential for Direct Conversion to Electricity," *The 8 th Annual Emerald Groundhog Day Investment Forum*, February 5, 2002, Wyndham Franklin Plaza Hotel, Philadelphia, PA, Organized by Emerald Asset Management, Lancaster, PA.
28. R. L. Mills, E. Dayalan, "Novel Alkali and Alkaline Earth Hydrides for High Voltage and High Energy Density Batteries," Proceedings of the 17th Annual Battery Conference on Applications and Advances, California State University, Long Beach, CA, (January 15-18, 2002), pp. 1-6.
27. P. Ray, R. Mills, "Spectroscopic identification of a novel catalytic reaction of hydrogen plasma," Session ET1: Lighting, American Physical Society Meeting, 54th Annual Gaseous Electronics Conference, October 9–12, 2001, Pennsylvania State University, State College, PA.
26. R. Mills, "Novel catalytic reaction of hydrogen as a potential new energy source," Division of Industrial and

Engineering Chemistry; Session: Industrial Bio-Based Technology, 222nd American Chemical Society Fall National Meeting, (August 26–30, 2001), Chicago, IL.

25. R. Mills, "Spectroscopic identification of a novel catalytic reaction of hydrogen," Division of Inorganic Chemistry; Session: Catalysis, 222nd American Chemical Society Fall National Meeting, (August 26–30, 2001), Chicago, IL.
24. R. Mills, "Spectroscopic identification of a novel catalytic reaction of hydrogen," Division of Physical Chemistry; Session: Physical Chemistry Poster Session, 222nd American Chemical Society Fall National Meeting, (August 26–30, 2001), Chicago, IL.
23. R. Mills, J. He, "Spectroscopic Identification of a Novel Catalytic Reaction of Atomic Hydrogen and the Hydride Ion Product," National Hydrogen Association, 12 th Annual U.S. Hydrogen Meeting and Exposition, *Hydrogen: The Common Thread*, The Washington Hilton and Towers, Washington DC, (March 6-8, 2001).
22. R. Mills, B. Dhandapani, M. Nansteel, N. Greenig, S. Hicks, J. Dong, "Optically Measured Power Balances of Anomalous Discharges of Mixtures of Argon, Hydrogen, and Potassium, Rubidium, Cesium, or Strontium Vapor," National Hydrogen Association, 12 th Annual U.S. Hydrogen Meeting and Exposition, *Hydrogen: The Common Thread*, The Washington Hilton and Towers, Washington DC, (March 6-8, 2001).
21. R. Mills, M. Nansteel, N. Greenig, S. Hicks, "BlackLight Power Technology-A New Clean Energy Source with the Potential for Direct Conversion to Electricity," National Hydrogen Association, 12 th Annual U.S. Hydrogen Meeting and Exposition, *Hydrogen: The Common Thread*, The Washington Hilton and Towers, Washington DC, (March 6-8, 2001).
20. R. Mills, B. Dhandapani, M. Nansteel, J. He, A. Voigt, "Identification of Compounds Containing Novel Hydride Ions by Nuclear Magnetic Resonance Spectroscopy," National Hydrogen Association, 12 th Annual U.S. Hydrogen Meeting and Exposition, *Hydrogen: The Common Thread*, The Washington Hilton and Towers, Washington DC, (March 6-8, 2001).
19. R. Mills, "BlackLight Power Technology-A New Clean Energy Source with the Potential for Direct Conversion to Electricity," *The 8 th Annual Emerald Groundhog Day Investment Forum*, February 1, 2001, Wyndham Franklin Plaza Hotel, Philadelphia, PA, Organized by Emerald Asset Management, Lancaster, PA.
18. R. Mills, "The Grand Unified Theory of Classical Quantum Mechanics," Global Foundation, Inc. Orbis Scientiae entitled *The Role of Attractive and Repulsive Gravitational Forces in Cosmic Acceleration of Particles The Origin of the Cosmic Gamma Ray Bursts*, (29th Conference on High Energy Physics and Cosmology Since 1964) Dr. Behram N. Kursunoglu, Chairman, December 14-17, 2000, Lago Mar Resort, Fort Lauderdale, FL.
17. R. Mills, "BlackLight Power Technology-A New Clean Energy Source with the Potential for Direct Conversion to Electricity," Global Foundation, Inc. conference entitled *Global Warming and Energy Policy*, Fort Lauderdale, FL, November 26-28, 2000.

16. R. Mills, B. Dhandapani, N. Greenig, J. He, J. Dong, Y. Lu, and H. Conrads, "Formation of an Energetic Plasma and Novel Hydrides from Incandescently Heated Hydrogen Gas with Certain Catalysts," August National ACS Meeting (220th ACS National Meeting, Washington, DC, (August 20-24, 2000)).
15. R. Mills, J. He, and B. Dhandapani, "Novel Alkali and Alkaline Earth Hydrides," August National ACS Meeting (220th ACS National Meeting, Washington, DC, (August 20-24, 2000)).
14. R. Mills, B. Dhandapani, N. Greenig, J. He, J. Dong, Y. Lu, and H. Conrads, "Formation of an Energetic Plasma and Novel Hydrides from Incandescently Heated Hydrogen Gas with Certain Catalysts," June ACS Meeting (29th Northeast Regional Meeting, University of Connecticut, Storrs, CT, (June 18-21, 2000)).
13. Mills, J. Dong, N. Greenig, and Y. Lu, "Observation of Extreme Ultraviolet Hydrogen Emission from Incandescently Heated Hydrogen Gas with Certain Catalysts," 219 th National ACS Meeting, San Francisco, California, (March 26-30, 2000).
12. R. Mills, B. Dhandapani, N. Greenig, J. He, J. Dong, Y. Lu, and H. Conrads, "Formation of an Energetic Plasma and Novel Hydrides from Incandescently Heated Hydrogen Gas with Certain Catalysts," 219 th National ACS Meeting, San Francisco, California, (March 26-30, 2000).
11. R. Mills, "Novel Hydride Compound," 219 th National ACS Meeting, San Francisco, California, (March 26-30, 2000).
10. R. Mills, J. He, and B. Dhandapani, "Novel Alkali and Alkaline Earth Hydrides," 219 th National ACS Meeting, San Francisco, California, (March 26-30, 2000).
9. R. Mills, J. Dong, N. Greenig, and Y. Lu, "Observation of Extreme Ultraviolet Hydrogen Emission from Incandescently Heated Hydrogen Gas with Certain Catalysts," National Hydrogen Association, 11 th Annual U.S. Hydrogen Meeting, Vienna, VA, (February 29-March 2, 2000).
8. R. Mills, B. Dhandapani, N. Greenig, J. He, J. Dong, Y. Lu, and H. Conrads, "Formation of an Energetic Plasma and Novel Hydrides from Incandescently Heated Hydrogen Gas with Certain Catalysts," National Hydrogen Association, 11 th Annual U.S. Hydrogen Meeting, Vienna, VA, (February 29-March 2, 2000).
7. R. Mills, "Novel Hydride Compound," National Hydrogen Association, 11 th Annual U.S. Hydrogen Meeting, Vienna, VA, (February 29-March 2, 2000).
6. R. Mills, J. He, and B. Dhandapani, "Novel Alkali and Alkaline Earth Hydrides," National Hydrogen Association, 11 th Annual U.S. Hydrogen Meeting, Vienna, VA, (February 29-March 2, 2000).
5. R. Mills, J. Dong, Y. Lu, J. Conrads, "Observation of Extreme Ultraviolet Hydrogen Emission from Incandescently Heated Hydrogen Gas with Certain Catalysts," 1999 Pacific Conference on Chemistry and Spectroscopy and the 35th ACS Western Regional Meeting, Ontario Convention Center, California, (October 6-8, 1999).
4. R. Mills, "Novel Hydride Compound," 1999 Pacific Conference on Chemistry and Spectroscopy and the 35th ACS Western Regional Meeting, Ontario Convention Center, California, (October 6-8, 1999).
3. R. Mills, B, Dhandapani, N. Greenig, J. He, "Synthesis and Characterization of Potassium Iodo Hydride,"

1999 Pacific Conference on Chemistry and Spectroscopy and the 35th ACS Western Regional Meeting, Ontario Convention Center, California, (October 6-8, 1999).

2. R. Mills, J. He, and B. Dhandapani, "Novel Hydrogen Compounds," 1999 Pacific Conference on Chemistry and Spectroscopy and the 35th ACS Western Regional Meeting, Ontario Convention Center, California, (October 6-8, 1999).

1. R. Mills, "Excess Heat Production by the Electrolysis of an Aqueous Potassium Carbonate Electrolyte," August 1991 meeting of the American Chemical Society, NY, NY.

Shelby T. Brewer
2121 Jamieson Avenue, Suite 1406
Alexandria, Virginia 22314

Tel: (703) 567-1284
Fax: (703) 566-7526
stbrewer@earthlink.net

A

December 21, 2001

VIA HAND DELIVERY

The Honorable James E. Rogan
Director, U.S. Patent and Trademark Office
Washington, D.C. 20231

Re: Patent Applications of BlackLight Power, Inc.

Dear Director Rogan:

I am writing to draw your attention to a matter involving the U.S. Patent and Trademark Office (PTO) that calls into question the professionalism, competence, and integrity of the PTO. As a former appointee (Reagan Administration, Assistant Secretary of Energy), technologist (nuclear engineering), and businessman (CEO and Chairman of several major US corporations over the past 15 years), I am heartened that you have finally taken up leadership of the PTO in the G.W. Bush Administration, and are in a position to reverse the sloth and abuses under the previous Administration. I have followed your public service career over the years, particularly your last term in the House, and am convinced that the President's choice to reform this critical agency could not have been more astute.

The matter that I invite your attention to involves the prosecution of a number of U.S. patent applications submitted by BlackLight Power, Inc., on whose Board of Directors I serve. My reasons for appealing to you in this matter are motivated not only by my fiduciary duty to protect BlackLight's best interests, but also by a sincere desire to assist you in avoiding unnecessary embarrassment this situation is sure to cause the Patent Office if left unresolved. We would be most pleased to personally meet with you and principles for the parties to see if together we can bring some closure to this matter in a way that is mutually acceptable to both sides.

Through your initial PTO briefing on important pending matters, you may be aware by now that five allowed applications relating to novel chemical compounds invented by BlackLight President and CEO, Dr. Randell L. Mills, were withdrawn from issue under extremely suspicious circumstances. That withdrawal led to a lawsuit that we filed in the D.C. District Court against Director Dickinson, which case was fully briefed and argued to the U.S. Court of Appeals for the Federal Circuit before a packed courtroom. The purpose of my letter is not to debate the legal issues in that case, as we are quite confident in our position based on the record presented to the Federal Circuit during oral argument. Rather, my aim is simply to make you aware of matters that PTO officials might have omitted from your initial briefing, including the prior administration's violation of well-established patent laws, rules, and procedures in prosecuting these and other BlackLight patent applications.

To be sure, BlackLight fully expected that, like any pioneering technology, its novel hydrogen chemistry would be carefully scrutinized by the Patent Office during the application process. Indeed, the two highly-qualified Examiners originally assigned to review BlackLight's applications, Wayne Langel and Stephen Kalafut, conducted a thorough examination, initially questioning the operability of the disclosed technology on several grounds. Upon critical review of BlackLight's supporting scientific evidence, however, the Examiners issued U.S. Patent No. 6,024,935 ("the '935 patent") drawn to an energy cell and allowed the five other chemical compound applications that were subsequently withdrawn from issue.

Examiners Langel and Kalafut displayed the utmost professionalism and courtesy in prosecuting BlackLight's applications and we certainly commend them for their actions. Unfortunately, the same cannot be said for others whose actions in withdrawing and subsequently prosecuting these and other cases have undermined the U.S. patent system to the detriment of all patent applicants. I offer the following examples for your consideration as possible topics for future discussion:

(1) Undercutting the statutory presumption of validity under 35 U.S.C. § 282

Underlying this 50-year-old statute is the premise of administrative regularity, which presumes that well-trained examiners with expertise in their respective fields will properly carry out their examination duties by issuing only valid patents. This presumption was, in fact, confirmed by the capable work Examiners Langel and Kalafut performed in examining and issuing BlackLight's '935 patent. Nonetheless, PTO Associate Solicitor Kevin Baer, for some explained reason, attacked BlackLight by denigrating the entire patent system, including its examining corps, by stating in open court:

> "[P]atent examiners do review [patent applications]. Unfortunately, patent examiners are swamped and sometimes things slip through."
>
> "[E]xaminers are under tremendous pressure to produce work, and if they're going to approve [an application], they just approve it and kind of let it out the door."

Solicitor Baer's statements on behalf of the PTO should be alarming to just about everyone–with the possible exception of accused patent infringers—and most certainly do not reflect well on the agency. Part of our purpose in seeking a meeting is to make you aware of these and other outlandish statements and to give the PTO the opportunity to issue an appropriate public retraction.

(2) Disparagement of U.S. patents in violation of MPEP § 1701

According to this well-established PTO procedural guideline, "[p]ublic policy demands that every employee of the [Patent Office] refuse to express to any person any opinion as to the validity or invalidity of . . . any U.S. patent . . . ." With the exception of exclusions that do not

apply, "[t]he question of validity or invalidity is otherwise exclusively a matter to be determined by a court. Members of the patent examining corps are cautioned to be especially wary of any inquiry from any person outside the [Patent Office], including an employee of another Government agency, the answer to which might indicate that a particular patent should not have issued." The PTO clearly violated this admonition when it publicly disparaged the '935 patent on the record.

In yet another blatant violation of these PTO rules, Solicitor John Whealan responded to a reporter's inquiry by stating unequivocally for a soon-to-be published article that "the PTO issued BlackLight's '935 patent by mistake."

Once again, we wish to meet with you to discuss the PTO's retraction of these statements. More importantly, however, we seek an honest explanation why the PTO has singled out BlackLight for such disparate treatment and what can be done to put an end to it.

(3) PTO involvement with competitors of applicants in denying patent rights

Naturally concerned over who and what precipitated withdrawal of BlackLight's allowed applications from issue, we became suspicious that it might have been caused by competitors interfering with our valuable patent rights. Our suspicions heightened when we learned that Dr. Peter Zimmerman, former Chief Scientist for the State Department, had published an Abstract of an upcoming speech to the American Physical Society (APS), a BlackLight competitor, boasting that his Department and the Patent Office "have fought back with success" against BlackLight. In conversations with BlackLight's counsel, Dr. Zimmerman admitted that he received information concerning BlackLight's applications through e-mails from Dr. Robert Park, spokesman for the APS, who told him of a contact in the PTO referred to by Dr. Park as "Deep Throat."

If true, these actions would clearly violate the PTO's duty to maintain confidentiality of U.S. patent applications under 35 U.S.C. § 122, 18 U.S.C. § 2071, 37 C.F.R. § 1.14, and M.P.E.P. § 101, as well as raise other obvious concerns. We brought this information to the PTO's attention more than a year ago, but have yet to receive a response.

We would like to meet with you to discuss PTO investigations into this matter and the extent to which any breach of confidentiality may have occurred.

(4) Improperly creating new opposition procedures against the issuance of patents

Following withdrawal of BlackLight's applications from issue, counsel immediately began investigating the facts and circumstances surrounding that incident by questioning various PTO personnel. During that investigation, Director Esther Kepplinger admitted to counsel that she withdrew the applications in reaction to perceived heat—a "firestorm" as she put it—the Patent Office had received from an undisclosed outside source. Director Kepplinger further indicated that the withdrawal occurred only after the '935 patent had been brought to the

attention of Director Dickinson by Gregory Arahorian, another PTO outsider well known for his public attacks on issued U.S. patents.

These events, which, in effect, created an entirely new, non-regulatory procedure for opposing the issuance of patents, are disturbing to say the least. In light of these circumstances, we firmly believe that we are entitled to a full accounting of how, out of the thousands of patents the PTO issues on a weekly basis, our '935 patent happened to come to its attention, thus leading to the withdrawal of other allowed applications.

Unfortunately, the PTO has been less than forthcoming in dealing with this matter as succinctly expressed by Solicitor Baer to District Court Judge Emmet G. Sullivan in the following comments: "I would even say, Your Honor, you could imagine in our head any scenario of how we learned about it. A blimp flying over us. It doesn't matter, because what matters, Your Honor, is the decision [to withdraw] itself." Apparently Judge Sullivan was unimpressed by those comments, noting in footnote 10 of his opinion his being "troubled by several steps in the PTO's process" and advising the PTO to "examine its patent issuance process so that their normal operations are not compromised by such seemingly suspicious procedures."

That worthwhile goal can only be fully achieved by a complete accounting of the events in question, which we hope will be among the topics discussed at an upcoming meeting.

(5) **Withholding vital information concerning the examination process**

Following Judge Sullivan's decision upholding the PTO's withdrawal procedure, now on appeal, the PTO replaced the original Examiners Langel and Kalafut with a "Secret Committee" to reject all BlackLight applications. To adequately respond, BlackLight's counsel has sought to discover the identity of all Committee members, as well as any outside consultants or competitors, involved in the examination process and the nature of their involvement. To our amazement, the PTO has thwarted those efforts at every turn, as well as similar inquiries into this matter by five U.S. Senators.

Through our own discovery efforts, one of the Secret Committee members contributing to the prosecution was identified as Vasudevan Jagannathan. Despite Examiner Jagannathan's role in examining our applications, he initially refused to admit his involvement. Examiner Jagannathan later refused to even attend an interview scheduled with Dr. Mills, counsel, and myself to discuss the pending rejections in an attempt to reach an agreement over the patentability of the claimed inventions. Examiner Jagannathan ultimately appeared at the interview, but only after being ordered to do so by his immediate supervisor, to whom we complained. The interview, however, almost ended as soon as it began when counsel requested full identification of those persons responsible for examining our pending applications. In response, Examiner Jagannathan became quite hostile, threatening to adjourn the interview if we further pressed that line of inquiry, unjustifiably asserting that it was "not germane" to the prosecution.

We believe that such secret examination proceedings are not the way to conduct PTO business, especially in light of the suspicious circumstances surrounding withdrawal of BlackLight's applications. These proceedings do little to instill confidence in the examination process. Like any applicant, BlackLight is entitled to a fair hearing, which includes the right to directly confront those persons responsible for refusing us our patent grant. We hope that this issue will also be on the table for discussion should you be kind enough to grant us a meeting.

These are but a few of the more egregious examples of how the PTO has mishandled the examination process leading up to and following the withdrawal of BlackLight's applications from issue. Equally distressing is the substance of the Secret Committee's refusal to grant BlackLight's patents based on challenges to the operation of our disclosed hydrogen technology.

BlackLight has submitted an unprecedented amount of scientific evidence—costing tens of millions of dollars to produce—proving beyond question the operability of our technology. As former Assistant Secretary of Energy in the Reagan administration with a Ph.D. in Nuclear Engineering from M.I.T., I can personally attest to this fact. Anyone, however, with even a basic understanding of chemistry and, more importantly, an open mind willing to look seriously at our data, can confirm for themselves that Dr. Mills' novel hydrogen chemistry is producing truly astonishing results.

Incredibly, the Secret Committee has basically dismissed our scientific evidence or ignored it altogether on the basis that it supposedly violates "ideas" of modern science. For example, the scientific evidence we submitted includes spectroscopic data that is extraordinarily reliable in analyzing chemical compositions. Such data amounts to a "chemical fingerprint" that cannot be seriously disputed. Yet, Examiner Jagannathan dismissed that conclusive evidence out of hand as nothing more than "a bunch of squiggly lines."

Words can hardly express the extreme frustration—and forgive me for saying, deep resentment—we feel in having our pioneering technology treated in such a cavalier way. I could go on and on citing other examples of similar indignities suffered at the hands of the Secret Committee and, hopefully, we will be allowed to convey those details to you in person. Suffice it to say for now that the positions espoused by the Committee hardly satisfy the Constitutional directive that the patent system "promote the progress of science and the useful arts."

Please let me know at your earliest convenience if you share our desire for a meeting to discuss this matter. If you do, please further consider holding this meeting at our facilities in Cranbury, New Jersey so that you can witness first hand our working prototypes of Dr. Mills' energy cell and his assortment of novel hydride compounds exhibiting unusual properties.

I look forward to receiving your response and wish you well in your new undertaking.

Most sincerely,

Shelby T. Brewer

UNITED STATES
PATENT AND
TRADEMARK OFFICE

Under Secretary of Commerce For Intellectual Property and
Director of the United States Patent and Trademark Office
Washington, DC 20231
www.uspto.gov

APR 24 2002

Mr. Shelby T. Brewer
2121 Jamieson Avenue, Suite 1406
Alexandria, Virginia 22314

Dear Mr. Brewer :

Thank you for your letter requesting a meeting with The Honorable James E. Rogan, Under Secretary of Commerce for Intellectual Property and Director of the United States Patent and Trademark Office, to discuss a number of U.S. patent applications submitted by BlackLight Power, Inc. Your letter has been referred to me for reply.

We appreciate your interest in this matter, but, unfortunately, must decline your request for a meeting due to the fact that USPTO is not in a position to discuss the issue at the present time.

Sincerely,

Jason C. Roe
Chief of Staff

UNITED STATES
PATENT AND
TRADEMARK OFFICE

Under Secretary of Commerce For Intellectual Property and
Director of the United States Patent and Trademark Office
Washington, DC 20231
www.uspto.gov

TELEFAX COVER SHEET

DATE: 5/1/02

TO: Mr. Matthew Thomas

FAX: 703-566-7526

FROM: Steven Sickman

Number of pages following: 1

COMMENTS: Here is a copy of the letter we spoke of.

Steve

Please call (703) 305-8600 if there are problems with this transmission. Thank you.

020402PTO.doc

Shelby T. Brewer
2121 Jamieson Avenue, Suite 1406, Alexandria, VA 22314
703 567 1284

April 2, 2002

The Honorable James E. Rogan
Director, U.S. Patent and Trademark Office
Washington, D.C. 20231

Dear Director Rogan,

Attached is a letter I sent to you in December 2001.

I would like to have a brief meeting with you sometime in early May 2002, if possible. The subject of the meeting is the content of the December 21, 2001 letter.

Respectfully,

Shelby T. Brewer

uses in the ordinary course of its business. Should any other documentation that catalogs the contents of the off-site warehouse exist that would be of assistance in determining whether further responsive documents exist at the site, Dell shall provide that documentation to Tulip. Should Tulip request additional responsive documents based on the index or catalog, Dell shall promptly comply.

2. Dell shall provide Tulip with responsive e-mail and electronic documents for the following persons: John Stuewe, Jeff Clarke, Gary Curtis, Karl Steffes, Timothy Radloff, Ajay Kwatra, Abeye Teshome, Matthew Mendelow, Kevin Miller, Richard Chan, Neil Hand, Joseph Marengi, Eric Sholder, and Ro Parra.

Dell shall provide the e-mails in electronic form to Tulip's consultant, Ontrack. Ontrack shall then have the opportunity to review the e-mails electronically, by searching the e-mails using an agreed upon set of search terms. Any e-mails that contain one of those search terms shall be reviewed by Dell and produced to Tulip subject to confidentiality and privilege designations.

3. Dell shall use its best efforts to identify, recreate, and produce to Tulip the contents of Box 92. In addition, when Dell seeks to dispose of documents from its off-site warehouse, Dell should continue to submit to Tulip a list of documents that it intends to destroy, so that Tulip can request that certain boxes, which it believes are responsive, be maintained for a reasonable period to allow them to searched, copied, and produced.

4. Dell shall endeavor to provide Tulip with the answers to its questions that its 30(b)(6) designee could not. Should another deposition be required, Dell shall pay the costs of that deposition.

5. The court will not at this time extend fact discovery from its current May 10, 2002 deadline. The parties should either submit to the court a mutually agreed-upon revised schedule or submit. In the event that the parties cannot come to an agreement on an extension, the parties shall submit a letter to the court setting forth their respective positions on whether the current discovery schedule should be extended.

BlackLight Power Inc. v. Rogan

U.S. Court of Appeals
Federal Circuit

No. 00-1530

Decided June 28, 2002

PATENTS

[1] Practice and procedure in Patent and Trademark Office — Fees (§ 110.03)

Practice and procedure in Patent and Trademark Office — Prosecution — Rules and rules practice (§ 110.0905)

U.S. Patent and Trademark Office may withdraw patent application from issuance after issue fee has been paid, even though second paragraph of 35 U.S.C. § 151 states that patent "shall issue" upon payment of fee, since opening clause of Section 151 conditions issuance on whether "applicant is entitled to a patent under the law," and since Section 151 does not prohibit PTO from interrupting sequence of procedures for notice of allowance and issuance if PTO officials reasonably believe that condition has not been met.

[2] Practice and procedure in Patent and Trademark Office — Fees (§ 110.03)

Practice and procedure in Patent and Trademark Office — Prosecution — Rules and rules practice (§ 110.0905)

U.S. Patent and Trademark Office is not required to make final determination of unpatentability before withdrawing application from issue pursuant to 37 C.F.R. § 1.313(b)(3), which permits PTO to withdraw application after payment of issue fee on ground of "unpatentability of one or more claims," since PTO's responsibility for issuing sound and reliable patents, complexity of examination process, and potential for error weigh in favor of according PTO latitude to withdraw application without final determination of unpatentability if responsible PTO official reasonably believes application may have been allowed in error, and exigencies of time do not allow for such final determination.

[3] Practice and procedure in Patent and Trademark Office — Fees (§ 110.03)

Practice and procedure in Patent and Trademark Office — Prosecution — Rules and rules practice (§ 110.0905)

U.S. Patent and Trademark Office did not act in arbitrary or capricious manner by withdrawing patent application from issue pursuant to 37 C.F.R. § 1.313(b)(3), which permits PTO to withdraw application after payment of issue fee on ground of "unpatentability of one or more claims," since PTO group director who requested that application be withdrawn, being generally advised of application's scope, reasonably believed that it had not been adequately examined, and took only available action to return application to examination, and since that summary action was reasonably within scope of agency's authority.

Appeal from the U.S. District Court for the District of Columbia, Sullivan, J.; 55 USPQ2d 1812.

Action by BlackLight Power Inc. against James E. Rogan, in his capacity as Director of the U.S. Patent and Trademark Office, alleging that withdrawal of patent application from issue by PTO, after plaintiff had received notice of allowance and paid issue fee, violated Administrative Procedure Act. Plaintiff appeals from grant of summary judgment for defendant. Affirmed.

Donald R. Dunner and J. Michael Jakes, of Finnegan, Henderson, Farabow, Garrett & Dunner, Washington, D.C.; Michael H. Selter and Jeffrey S. Melcher, of Manelli, Denison & Selter, Washington; Jeffrey A. Simenauer, Washington, for plaintiff-appellant.

John M. Whealan, Marshall S. Honeyman, Stephen Walsh, and Henry G. Sawtelle, of Office of the Solicitor, U.S. Patent and Trademark Office, Arlington, Va., for defendant-appellee.

Before Newman, Clevenger, and Schall, circuit judges.

Newman, J.

The question on appeal is whether the Director of the Patent and Trademark Office had the authority summarily to withdraw BlackLight's patent application from issue, following Notice of Allowance, payment of the issue fee and notification of the issue date, and with publication of the drawing and claim in the Official Gazette. We conclude that such withdrawal was within the scope of the Director's authority and responsibility for performing the mission of the Patent and Trademark Office, when viewed in light of the unusual circumstances of this case. The district court's judgment is affirmed.[1]

BACKGROUND

BlackLight Power Inc. conducts research into new sources of energy. BlackLight is the owner of United States Patent Application No. 09/009,294 entitled "Hydride Compounds." As described in BlackLight's brief, the inventions claimed in this and several related patent applications and an issued patent are directed to new energy technology derived from hydrogen compounds, and new compositions including conductive magnetic plastics and corrosion-resistant high-strength coatings.

During examination of the '294 application, the examiner initially rejected the claims on various grounds including operability under 35 U.S.C. § 101 and enablement and definiteness under § 112. After further prosecution including discussions of experimental results and the submission of samples, the examiner withdrew the rejection and allowed the claims. A Notice of Allowance was issued on October 18, 1999, the issue fee was paid, and issuance was noticed for February 29, 2000.

Another BlackLight patent application, entitled "Lower-Energy Hydrogen Methods and Structures," issued as United States Patent No. 6,024,935 on February 15, 2000. Shortly thereafter, prompted by an outside inquiry, the Director of the Group that had examined these applications was made aware of both the '935 patent and the imminent issuance of the '294 application. By Declaration filed in the district court, Group Director Kepplinger stated that upon reading the patent her "main concern was the proposition that the applicant was claiming the electron going to a lower orbital in a fashion that I knew was contrary to the known laws of physics and chemistry." Director Kepplinger believed that the '935 patent and the '294 application were directed to similar subject matter, and contacted Robert Spar, Director of the Special Program Law Office in the Office of the Deputy Assistant Commissioner for Patents. Director Spar stated by

---

[1] *BlackLight Power, Inc. v. Dickinson*, 109 F. Supp.2d 44, 55 USPQ2d 1812 (D.D.C. 2000).

Declaration that Director Kepplinger expressed concern that the '294 application "possibly had serious and substantial patentability problems and asked me to withdraw it from issue for further review."

On February 17, 2000 a Notice was issued to BlackLight, stating that the '294 application "is being withdrawn from issue pursuant to 37 C.F.R. 1.313 . . . to permit reopening of prosecution . . . [as] requested by the Director, Special Program Law Office." It is undisputed that no one involved in the withdrawal had reviewed the '294 patent application before issuance of the Notice; at the argument of this appeal the PTO Solicitor stated that the application was not available for review because the file was in Pennsylvania for printing of the patent document.

BlackLight's attorneys made prompt inquiries about the withdrawal. The PTO treated the inquiries as a petition to the Commissioner requesting reversal of the withdrawal. On March 22, 2000 the petition was denied by decision of Assistant Deputy Commissioner Kunin. The decision stated that "[t]he PTO has an obligation to issue patents that meet the statutory requirements for patentability," and concluded that Director Kepplinger did not act improperly in obtaining withdrawal of the '294 application for further examination. The decision referred to Director Kepplinger's concern about the correctness of the scientific theory set forth in the issued '935 patent, described in the decision as "the discovery that energy was released by stimulating hydrogen atoms to relax, and, in so doing, to shrink to smaller radii, and to also attain energy levels below their 'ground state' according to a 'novel atomic model,' " and Director Kepplinger's belief that the '294 application was based on the same theory. The decision stated that Commissioner Kunin's inspection of the '294 application "reveals that this invention is asserted [sic] to matters containing fractional quantum numbers. Such fractional quantum numbers do not conform to the known laws of physics and chemistry." The decision did not further discuss patentability, but stated that the application would be returned to examination.

Meanwhile, on March 1, 2000 BlackLight filed suit against the PTO Commissioner (now denominated "Director") in the United States District Court for the District of Columbia, charging that the withdrawal was contrary to law and in violation of the Administrative Procedure Act, 5 U.S.C. § 701 *et seq.* BlackLight argued that 35 U.S.C. § 151 compels issuance when the issue fee has been paid:

> *35 U.S.C. § 151.* If it appears that applicant is entitled to a patent under the law, a written notice of allowance of the application shall be given or mailed to the applicant. The notice shall specify a sum, constituting the issue fee or a portion thereof, which shall be paid within three months thereafter.
>
> Upon payment of this sum the patent shall issue, but if payment is not timely made, the application shall be regarded as abandoned.

BlackLight argued that § 151 does not allow for withdrawal of an application by the PTO after the issue fee has been paid, and that the PTO officials exceeded their authority when they withdrew the '294 application.

BlackLight also argued that 37 C.F.R. § 1.313, the regulation cited by the PTO in withdrawing the application, violates the mandatory statutory language of § 151:

> *37 C.F.R. § 1.313*
>
> *(a).* Application may be withdrawn from issue for further action at the initiative of the Office or upon petition by the applicant
>
> . . . .
>
> *(b).* Once the issue fee has been paid, the Office will not withdraw the application from issue at its own initiative for any reason except:
>
> (1) A mistake on the part of the Office;
>
> (2) A violation of § 1.56 or illegality in the application;
>
> (3) Unpatentability of one or more claims; or
>
> (4) For interference.

BlackLight stated that even if some form of withdrawal authority were deemed to exist as set forth in § 1.313(b), the PTO exercised that authority in an arbitrary and capricious manner, for there had been no determination of unpatentability of any of the claims allowed in the '294 application.

The district court held that the PTO's interpretation of its statutory authority is entitled to deference in accordance with *Chevron U.S.A., Inc. v. Natural Resources Defense Council, Inc.*, 467 U.S. 837, 842-44 (1984), and that the district court had so held in *Harley v. Leh-*

man, 981 F.Supp. 9 [44 USPQ2d 1699] (D.D.C. 1997). The court concluded that the PTO's action in withdrawing from issue the '294 application (and subsequently four related applications) was "reasonable," reasoning that 37 C.F.R. § 1.313(b) "functions as a last-chance procedural measure to observe the PTO's central mandate of issuing viable patents," and sustained the action of the PTO.

DISCUSSION

BlackLight argues that 35 U.S.C. § 151 commands the PTO to issue the patent upon payment of the issue fee, pointing out that the second paragraph of § 151 states that "the patent shall issue" upon payment of the fee. The PTO responds that § 151 starts with the conditional clause: "If it appears that applicant is entitled to a patent under the law . . . ."

[1] We agree with the PTO that while the words "shall issue" indeed impose a duty, the preface to § 151 places a condition on that duty. This preface conditions not only the issuance of the notice of allowance but also the ensuing steps of § 151. Statutory interpretation is "not guided by a single sentence or member of a sentence, but look[s] to the provisions of the whole law, and to its object and policy." *Dole v. United Steelworkers of Am.*, 494 U.S. 26, 35 (1990) (internal citations omitted).

Both paragraphs of § 151 together define the obligations and procedures of the notice of allowance and issuance. Section 151 does not prohibit the Office from interrupting the sequence if the condition set forth in the opening clause is reasonably believed not to have been met. Correct statutory interpretation is that which is "most harmonious with [the statutory] scheme and with the general purposes that Congress manifested." *Commissioner v. Engle*, 464 U.S. 206, 217 (1984) (internal citations omitted). We conclude that § 151 does not prohibit withdrawal by the PTO of a patent application after the issue fee has been paid.

BlackLight states that even if the PTO has statutory authority to withdraw applications, such withdrawal is limited to the grounds specified in the implementing rule, 37 C.F.R. § 1.313(b). BlackLight argues that none of these grounds applied, and specifically that ground (3), "unpatentability of one or more claims," requires a determination of unpatentability before the provision can be invoked, and not a mere hint or suspicion. The district court held that § 1.313(b)(3) did not require a "final pronouncement" of unpatentability at the time of withdrawal.

[2] The object and policy of the patent law require issuance of valid patents. This responsibility, and the mission of the PTO, require authority to implement § 151 by taking extraordinary action to withdraw a patent from issue when a responsible PTO official reasonably believes that the subject matter may be unpatentable and that the application may have been allowed in error. The complexity of the examination process, and the potential for error in any human activity, weigh on the side of according the PTO latitude to withdraw an application from issue without a final determination of unpatentability when the exigencies of time do not allow for such determination.

[3] The decision to withdraw the application was made by PTO officials acting within their authority and in fulfillment of their obligation to assure that patents are properly examined, and valid. In *Skidmore v. Swift & Co.*, 323 U.S. 134, 139-40 (1944) the Court observed that agency actions are entitled to judicial respect when they are reasonably taken and in accordance with the "specialized experience" of agency officials and the "validity of its reasoning." Director Kepplinger, who is presumed to be knowledgeable in the fields of physics and chemistry, upon review of the '935 patent and being generally advised of the scope of the '294 application, reasonably believed that the '294 application had not been adequately examined, and took the only available action to return the '294 application to examination. That summary action was reasonably within the scope of the agency's authority and was not an arbitrary or capricious action. In *Baltimore & Ohio Railroad Co. v. United States*, 386 U.S. 372, 421 (1967) Justice Brennan remarked, in concurrence, on "the importance of leaving great flexibility with the agency to deal with emergency situations" in order to avoid harming that which the agency oversees. Such action must of course be reasonable under the circumstances and rare in occurrence, lest the emergency become the rule. But when necessary in order to fulfill the PTO's mission, with safeguards to the interests of the applicant including fair and expeditious further examination, we agree with the district court that the action taken is

a permissible implementation of the statute and regulation.

The PTO's responsibility for issuing sound and reliable patents is critical to the nation. It has not been shown that the PTO's exigent action was unreasonable in view of the scientific concerns of the Group Director and the imminent issuance of the patent. In *In re Alappat*, 33 F.3d 1526, 1535, 31 USPQ2d 1545, 1550 (Fed. Cir. 1994) (*en banc*) this court sustained extraordinary action when the Commissioner in good faith believed that such action was required to ensure the issuance of valid patents, observing that "the Commissioner has an obligation to refuse to grant a patent if he believes that doing so would be contrary to law."

The judgment of the district court is affirmed.

No costs.

AFFIRMED

Tamko Roofing Products Inc. v. Ideal Roofing Co.

U.S. Court of Appeals
First Circuit

Nos. 01-1382, 01-2273

Decided June 28, 2002

REMEDIES

[1] Monetary — Attorneys' fees; costs — Trademarks and unfair trade practices — Exceptional case (§ 510.0907.03)

Proper standard for awarding attorneys' fees and costs in connection with appeal, pursuant to 15 U.S.C. § 1117(a), does not require that appeal be frivolous in order to justify award of fees, or require fees to be automatically awarded whenever case is deemed "exceptional" at trial level; instead, appellate court will assess and weigh several factors, including whether appeal was on issues different from those that caused federal district court to find case exceptional, relative strengths or weaknesses of appellate issues, extent to which appeal prolonged, without adequate justification, particularly bad exceptional case, and whether losing party's position on appeal appears to be of a piece with earlier malicious, fraudulent, deliberate, or willful acts of infringement, or is otherwise inequitable.

[2] Monetary — Attorneys' fees; costs — Trademarks and unfair trade practices — Exceptional case (§ 510.0907.03)

Prevailing plaintiff's application for award of attorneys' fees and costs in connection with defendant's unsuccessful appeal is denied, since defendant's appeal was on issues different from those that caused federal district court to find case "exceptional" under 15 U.S.C. § 1117(a), since defendant's arguments, although not strong, were respectable, and addressed areas of law that were unclear, and since appeal did not prolong, without justification, case that district court found to be exceptional.

Appeal from the U.S. District Court for the District of New Hampshire, DiClerico, J.

Action by Tamko Roofing Products Inc. against Ideal Roofing Co. Ltd. for trademark infringement, in which jury returned verdict for plaintiff. District court entered judgment awarding defendant's profits to plaintiff, ordering defendant to pay plaintiff's attorneys' fees, and issuing permanent injunction. Judgment was affirmed on appeal (61 USPQ2d 1865). On plaintiff-appellee's application for award of attorneys' fees and expenses incurred on appeal. Denied.

Christopher R. Benson, Marcy Hogan Greer, and Susan J. Hightower, of Fulbright & Jaworski, Austin, Texas, for plaintiff-appellee.

H. Joseph Hameline, Rosemary M. Allen, Geri L. Haight, and Michael B. Clapp, of Mintz, Levin, Cohn, Ferris, Glovsky & Popeo, Boston, Mass., for defendant-appellant.

Before Selya, circuit judge, Campbell, senior circuit judge, and Lynch, circuit judge.

Lynch, J.

Tamko Roofing Products, after winning its trademark infringement action at trial, and prevailing on a subsequent appeal by the infringer Ideal Roofing Company, brings this application for an award of reasonable attorneys' fees and expenses in connection with the appeal. We articulate the standards to be used in the analysis and deny Tamko's application because we find that Ideal's appeal did not

Friday, September 6, 2002

1. HERBAL NONSENSE: DON'T MESS AROUND WITH MOTHER NATURE.
Even as many of the most popular herbal medications failed miserably when subjected to actual tests (WN 23 Aug 02), one concoction of saw palmetto, said to include seven Chinese and Indian herbs, seemed to be just as effective in treating prostate cancer as the latest prescription drugs. This was not as remarkable as it seemed: as a natural dietary supplement, PC-SPES could be sold over the counter without proof of purity or effectiveness (WN 16 Aug 02). But the FDA contended PC-SPES contained prescription- only drugs, and pulled it off the market. It is now confirmed by independent laboratories that PC-SPES contained warfarin, a blood thinner, indomethacin, an analgesic, and synthetic estrogen. These are prescription-only drugs not found in nature.

2. PATENT NONSENSE: COURT DENIES BLACKLIGHT POWER APPEAL.
The status of BlackLight Power's intellectual property is fuzzier than ever. BLP was awarded Patent 6,024,935 for "Lower-Energy Hydrogen Methods and Structures," a process for getting hydrogen atoms into a "state below the ground state" (WN 18 Feb 00). You might expect these shrunken hydrogen atoms, called "hydrinos," to have a pretty special chemistry. Do they ever! Indeed, a second patent application titled "Hydride Compounds" had been assigned a number and BLP had paid the fee. Several other patents were in the works. That's when things started heading South. Prompted by an outside inquiry (who would do such a thing?), the patent director became concerned that this hydrino stuff required the orbital electron to behave "contrary to the known laws of physics and chemistry." The Hydride Compounds application was withdrawn for further review and the other patent applications were rejected. Since the one patent already issued involves the same violations of basic laws of physics, there is a cloud over its status as well. BLP filed suit in federal court arguing that it was too late for the Patent Office to change its mind. The court was not impressed, so BLP appealed the decision. In denying the appeal, the court said the Patent Office has a responsibility to take "extraordinary action" to withdraw a questionable patent. The long-awaited IPO may have to wait a little longer.

3. LANCE BASS: MAYBE THE RUSSIANS JUST DON'T LIKE MUSIC.
Russian space officials say the boy-band star stiffed them on the $20M fare to the ISS, so they evicted him from Star City and gave his seat on Soyuz to a box of supplies. But MirCorp

still needs the do[illegible] and deals are still being discussed. [illegible] is said to involve a [illegible]jor [illegible] drink company. Pepsi and Coke have fought it out in space for years. Mir cosmonauts inflated a giant Pepsi can on a space walk (WN 5 Nov 99), while Coke was involved in developing a $3M micro-gravity Coke machine that gave only foam when it was tested before a world-wide audience on television.

Bob Park can be reached via email at opa@aps.org

THE AMERICAN PHYSICAL SOCIETY and THE UNIVERSITY OF MARYLAND

Opinions are the author's and are not necessarily shared by the American Physical Society or the University, but they should be.

mes Randi Educational Foundation
ducational resource on the paranormal, pseudoscientific and the supernatural

WIFT

September 20, 2002

ne Newsletter of the JREF

lini and the Rabbi, The Patent Office Again, A Perpetual on/Emotion Car Breaks Down, More Magnetized Water, and Where Are the Penta People.....?

r Avital Pilpel, who provides us with so good items, says that he "stumbled upon" cerpt from a 1948 book, "The Unfailing (1930), the autobiography of Rabbi Dr. rd Drachman. The Rabbi was a prominent in New York's Jewish community, and was / connected with the Jewish Theological ary in NYC. He died in 1945, aged 84 years.

HARRY HOUDINI

an interesting item, in that it provides us e views of a well-educated and intelligent r, regarding a matter that has not been well d by the media and the academic unity in general, and about which I have knowledge. This is taken from chapter 42 of ok:

A few events of special significance stand out . . . One of these was the passing of Houdini, which occurred, if I recall correctly, in the month of October, 1927.

o, it was in 1926....

It was my sad privilege to officiate at the funeral. His passing became the occasion for the widespread discussion of his personality and the extraordinary powers which he unquestionably possessed. His ability to free himself with astonishing swiftness from chains and padlocks and other means of restraint baffled all investigators.

What these powers were I, of course, know as little as anyone else, but they certainly were far exalted above the vulgar sleight of hand and tricks of ordinary so-called magicians. The Spiritualists claimed Houdini as one of their own and asserted that his escape from apparently insuperable means of confinement was due to his ability to dematerialize his body and thus pass through all physical restraints. Houdini himself denied that he was a Spiritualist medium — he was, indeed, an outspoken opponent of Spiritualism — and stated that his performances were strictly in accordance with natural law.

abbi Drachman could have accepted this simple, correct, honest, direct, nt from Harry Houdini, but that would seem to require the Rabbi to admit that ot understand how the apparent miracles of the magician had been lished. So, he ascribed special mystical powers to Houdini, forces that *no*

Commentary Archi
Want more? Vi Randi's Opinio visiting the arc Click here.

Support the JREF
How You can Help
Help support the JREF t donations, grants, gifts memberships. Click her learn more.

Email List
Subscribe to R email "Info List. details, send a email message JREFInfo-help@ssr.co

Search

not even Houdini himself, could be e..ed to understand. And that scenario, as to so many others who have wond..d a[redacted] such matters, satisfied the em. I must differ with his designation of sleight-of-hand as "vulgar." True, some pretty bad, but even the fumblers among us don't deserve that adjective....

This statement, of course, left the matter as much of a mystery as before. The Spiritualists refused to accept Houdini's denial that he was a medium. They insisted that he was. They even tried to drag me into the controversy as upholding their contention. In my funeral address, I had used the words, "Houdini possessed a wondrous power that he never understood and which he never revealed to anyone in life." These words are to be taken in their narrowest and most literal significance. All I meant was that Houdini possessed an extraordinary and mysterious power — and by that statement I am still willing to stand — the precise nature and quality of which was not clear even to him and that he had never taken anyone into his confidence nor revealed what his concept of his extraordinary gift was.

I must tell you that Harry Houdini fully and completely understood his "powers," hey were the same as those possessed by magicians from the very first ent a rascally cave-man asked his friend to "Choose a rock, any rock." drous" only applies from the point of view of the average spectator. And, I must Houdini's methods and secrets were well-known — to the magicians — in his ifetime. We "in the trade" are well aware of his methods, they are still in use , and will be in active use when a future mountebank (just kidding!) asks a fair en, "Choose a planet, any planet."

But the Spiritualists seized upon these words to draw from them the utterly unjustified inference that I considered Houdini a Spiritualist medium and that his extraordinary powers were derived from a super-mundane, non-material source. Arthur Conan Doyle, the well-known author and Spiritualist leader, interprets them to that effect in his book, "The Edge of the Unknown." [1930] Of course, I meant nothing of the kind. My statement was simply a recognition of his undeniably extraordinary power, concerning the nature of which I admit that I am just as ignorant as everybody else, including A. C. Doyle, neither more nor less.

However, it is not because of this aspect of his personality that I esteemed and respected Houdini and cherish his memory. My respect and, I may say, my love went to him, as a true friend, as a generous and unselfish character, as a loyal and truly filial son, and as a Jew with a warm Jewish heart. As such and for these reasons his name will ever be held in honor as a worthy son of Israel.

ed. That last sentence is certainly true and sensible. Harry Houdini was a mer of *apparent* miracles, and not one who claimed his tricks were the real He freely admitted, and in fact insisted, that there was nothing supernatural or ormal about his abilities, and that in itself should invoke our serious respect. He man who because of his fame and his talents could have chosen to claim that is specially gifted, but he did not; he had a deep sense of his ethnic background adition, his family responsibilities, and in particular his need for the acceptance beloved mother. Not only the Jews, but all of us can rejoice that he was among

Ipel adds:

Obviously, there is nothing new under the sun. Spiritualists who claimed that Houdini was a medium who wouldn't admit it, moved on to blaming Randi for deliberately using his formidable "psychic powers" to thwart the efforts of would-be challengers to win the foundation's $1,000,000 prize . . . One would have hoped that the "mediums" and other frauds would at least try to change their *modus operandi* once every fifty years or so. Ah, well....

'old Bob Park of the APS (American Physical Society) once more made our for us when he announced that the United States Patent Office was re- lering yet another patent — number 6,024,935, this time — granted to ight Power, who will edify you with a pretty heavy description of what they call Grand Unified Theory of Classical Quantum Mechanics," if you give them a e. They're at www.blacklightpower.com.

atent was for "Lower-Energy Hydrogen Methods and Structures," which they be as a process for getting hydrogen atoms into a "state below the ground whatever that means. Yes, I'm admitting my ignorance of the subject, but I happily to Bob. The patent involved something called "shrunken hydrogen , called "hydrinos." Bob writes:

> . . . the patent Director became concerned that this hydrino stuff required the orbital electron to behave "contrary to the known laws of physics and chemistry." The Hydride Compounds application was withdrawn for further review and the other patent applications were rejected. Since the one patent already issued involves the same violations of basic laws of physics, there is a cloud over its status as well. BLP filed suit in federal court arguing that it was too late for the Patent Office to change its mind. The court was not impressed, so BLP appealed the decision. In denying the appeal, the court said the Patent Office has a responsibility to take "extraordinary action" to withdraw a questionable patent.

! But why, hard on the heels of re-examining other questionable patents (see weeks ago on this page), would the Patent Office have happened upon this ılar one, when there are so many in this category? The secret can be inferred Bob Park's weekly column, where we find: "Prompted by an outside inquiry would do such a thing?) . . ." That rascal!

ery fact that the Patent Office has paid heed to the complaints that Park, the and others have made, speaks well for rationality. Let's hope that we can look d to many quack devices and systems being re-evaluated. Let's see a lot more "extraordinary action" from the Director. As for Blacklight Power, says Park, long-awaited IPO may have to wait a little longer."

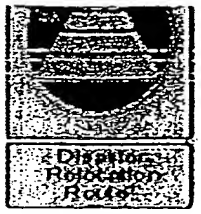
---

similar subject, reader David J. Schuller informs us of yet another entry in the nergy/perpetual motion" racket, a car that was recently scheduled to do sive test runs at a big race track, rented for that very purpose. Depend on it, heme, too, will make money while federal trade agencies and law enforcement ue to look the other way. Life savings will be lost, and those who can least to go under, will find themselves adrift while the promoters wear a path to their David tells us...

> . . . of a demo of an electric car which is supposed to recharge itself (i.e. perpetual motion). The inventor is Carl Tilley of Lebanon, Tennessee, at www.greaterthings.com/News/Tilley/newstuff/index.html. The car ran a few laps, then conveniently broke down due to mechanical failure not associated with the power source. Be sure to note the exclamations about the resting voltage measured on the batteries (as opposed to measuring under load). Next time they say they'll bring two cars instead of one. I'm sure that will be Real Soon Now. Be sure to check out the other articles on the web site which provide the regular updates: www.greaterthings.com/News/. It appears to be vaguely Christian with a strong interest in conspiracy theories. I'll keep an eye on [a local newspaper that covered the event] for a few days to see if they do any followup or not. In fact, I think I'll send them a note specifically requesting followup.

a moment. Looking at the
r Things" page, I see that these

are not just, as David says, "vaguel, jan," at all. They're raving loonies! 're very big on quotations, ularly from the Bible, but not much ality. The crazy old ntrails/contrails" thing is discussed, with the dreaded "666" subject; they us that Bill Gates, Saddam Hussein, Kissenger (their spelling), and even aur Barney, are all represented by nd they ponder on whether Prince es is actually Satan. The "Bible Code" is a big theme here, too. But the very nd most potent revelation of all is found in their warning that the US FEMA ral Emergency Management Agency) has embarked on imposing "Marshall (their spelling) on the citizens of the USA, a scheme which is cleverly aled in their officers' shoulder-badge — seen here — the *very same symbol* ne Canadian Government uses to indicate disaster-escape routes! How could it y clearer that evil forces are at work here? The text of this warning even tells us ne of the Canadian highway signs was discovered to be located "right IN JT of a church"!



Canadian road sign

famous poet might have said, "An equilateral triangle is an equilateral triangle is uilateral triangle," or a famous quack psychiatrist could have declared, etimes a triangle is just a triangle."

t's get back to the "real" science here, while not dismissing the paranoia, of e. (If you did that, people would start talking about you....) The brains on the site tell us that the twelve 12-volt batteries (!) that run the car are "recharged by prietary internal process." Then they reveal the big secret of this process by g, "The battery gets the motor going, and the motor then feeds energy back to tteries." *This* is the method? The mind boggles....

o top off the account of this aborted demonstration of the car, we're informed ey didn't get the expected constant feedback from the race track, because the y on their reporter's cell phone went dead. Seems appropriate.

ll put in here a simple question for David, who so kindly alerted us to this r: Why do I receive so many of these items written all in lower case, without uation or spacing between sentences, and all in *one* monstrous paragraph? I o pick through and revise the text, space it, and punctuate it, to make it ble and suitable for use. Are the shift key and space bar that hard to find on eyboard, David? I'll send you a diagram....

---

een sent a correction of some exchanges I quoted here two weeks ago. I got ributions and the division wrong. It's a change from this:

[To George] Sure you do. It works just as well as the magic fuel conditioner you sell. *Ad nauseam*, I note that this "demo" would win you a million if you could do it double blind. But you won't even try, because Randi won't accept such a challenge. The studies have been done and demonstrate the difference between magnetically treated and untreated water. Kronenberg published the before and after magnetic treatment pictures and you saw them. Cranfield University has similar before and after pictures on their web site from their studies and you saw them. Trinity College Dublin have before and after pictures from their study and you saw them.

[To John Bain from George] Sure you do. It works just as well as the magic fuel conditioner you sell. *Ad nauseam*, I note that this "demo" would win you a million if you could do it double blind. But you won't even try....

[From John Bain to George] Because di[illegible] accept such a challenge. The studies have been done and demonstrate the difference between magnetically treated and untreated water. Kronenberg published the before and after magnetic treatment pictures and you saw them. Cranfield University has similar before and after pictures on their web site from their studies and you saw them. Trinity College Dublin have before and after pictures from their study and you saw them.

That did seem a bit strange when I first saw it. Removing the endless codes nsfer text, I sometimes lose important factors. Sorry! And yes, we *will* accept test, Mr. Bain, just so long as "tap water" or similar water without any added c compounds, is used. In fact, I e-mailed Mr. Bain as follows:

course not impossible that magnetic treatment of *specially-selected* water es might give the result you claim. The Trinity College account that you cite pecifies "mineral water" and "well water." Both these are very general terms, ned, and totally unacceptable. Please do not now report that 'James Randi that treatment by static magnets alters water in such a manner that a suitably ve person can detect, by taste, the difference between treated and untreated ' This is *not* what I'm saying."

Mr. Bain, whether or not we accept the Trinity College material, or the nberg or the Cranfield accounts that you quote, has *nothing to do with your* You have a specific claim. Let's get on with it.

in....?

---

rd Morey from Australia sent us this newspaper article on the same tired, silly bject of weeping, bleeding religious figures:

Weeping Statue Draws Crowds

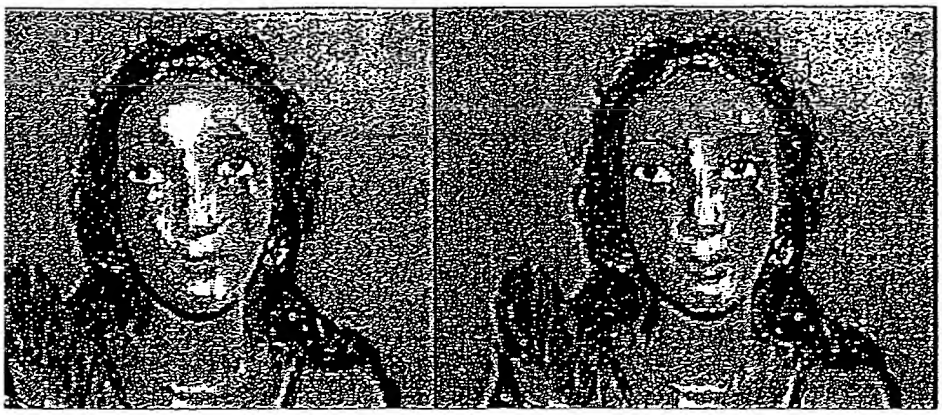
A fiberglass statue of the Virgin Mary bought in Thailand eight years ago has attracted hundreds of sick visitors to the suburban Perth home of Patty Powell. The statue has been claimed by many to be a miracle because it appears to drip a rose-scented oil-like substance from the eyes.

Ms. Powell said when the statue first cried on March 19 this year, she became overwhelmed with grief. "I cried the first time, it felt like my own mother was crying, it was a very humbling experience and really blew me away," she said. She said she was not sure whether it was a personal revelation she had witnessed until the statue "cried again" over the Easter period.

She said the statue, which she said she bought for about $150 at a religious shop in Bangkok, has since been weeping continuously. "I knew in my heart then what was happening and thought that maybe this was supposed to be seen by more people than just me." Since then, hundreds of people have made the pilgrimage to Ms. Powell's Rockingham home where she has set up a shrine to the Our Lady of Lourdes church to see the statue on display and to touch some of the oil. "The people who come to see her (the statue) are so devout and so reverent, it feels as if my life is just beginning."

She said that she did not know whether the statue would continue to weep or whether she would move it from her home but wanted to take things on a "day-to-day basis at this stage." Ms. Powell said Catholic Archbishop Barry Hickey had seen the statue but had said that as yet, no official proceedings would be made to have the its powers formally recognized by the church.

,od. That's refreshing indeed. Hey, folks, grow[redacted] Ask a few basic questions. e an adolescent in the house? Anyone else with something to prove? Does owell herself have an axe to sharpen, here?



Before After

ormed an experiment. This statue, a plaster one that sells for $1,000, can be improved just by keeping the rascals from secretly squirting oil, perfume, ng lotion, or cologne, on the lady. See the results!

---

er David Bellows writes us about his ience with one of the scams we've handled We're still waiting to hear from the Penta e, who we understand have been hiding in a n Colorado with Sylvia Browne:

Skeptics searching for Sylvia Browne and the Penta executives.....

I happen to work at a health food store in Atlanta, Georgia. One of our best-selling products is Penta water, in fact we bring in around 200 cases of the stuff every week. I work in the produce section so I do not have much contact with people looking at Penta water. However, since I've been there for over six years people do occasionally seek out my opinion.

Recently a man came up to me with three cases of Penta water in his cart (most people buy by the case it seems) and asked me what I thought of it. I told him that it appears to be the same filtered water ("reverse osmosis") we sell for $.39 a gallon and that there have been no reliable studies conducted to indicate otherwise. He said that he'd been using the water for several months and that it seemed to help him but he couldn't be sure that it wasn't just all in his mind. His use of it is based on the claim that because it is supposedly absorbed better into your cells you'd have less "left-over" water that would be eliminated by urination. This is a concern for him as he is a long-haul truck driver and given that he drinks lots of water while driving he doesn't want to have to pull over for rest stops every fifteen minutes.

I told him that we, as humans and whatever before had been drinking regular old water for thousands, tens of thousands, and even hundreds of thousands of years and our bodies were probably pretty good at handling it by now whether or not it "clusters" like Penta claims. He laughed and said that I'm probably right and put back one of the cases. Small victory (he did still buy two cases) but the important thing is that

it had already occured to him that t... itive effects he'd witnessed might possibly not be real.

My comments perhaps provided some confirmation which made it easier for him to put back one of the cases. Of course causing the store to lose sales like this does eventually hurt me in the pocket book, but if people ask my opinion I give it.

(There is a new water being sold in our store called Vivo Water. It claims to "clump" in some beneficial manner. More than a few customers have noted the apparent contradiction in "water theory" between Vivo and Penta. When they ask my opinion all I can do is shrug.)

, I sometimes think of how embarrassed I would be if I were caught buying Water or any of the other quack material so widely sold now. Reminds me of ‹e that illustrates how mores have changed in recent years:

A teenage boy steps up to the pharmacy counter and loudly declares, "I'll take a dozen of your best condoms!" As the clerk reaches for the merchandise, the kid leans forward and whispers softly to him, "And — a pack of Marlboros...."

ɛr Brian S. Lewis chides me about writing: "I have great faith in the Sun ng up tomorrow morning because evidence — my experiences, some 27,073 m to date — have established for me that it's quite probable that the event will ." He says:

I don't disagree with your point, but there is one small thing that needs saying: there is no logically sound reason to base guesses about thefuture on events in the past. Perhaps the way that it works is that James Randi is born, and the Sun goes out on his 27,100th day. There is a philosophy thought-problem related to this in which people are having a raffle over the course of a week and are guessing which color god will make the sky. I think I read about it in Simon Blackburn's book, "Think."

is missing the point here. What author Blackburn refers to are phenomena like g a "fair" coin. No "run" or pattern of "heads" (or "tails") can influence the next ɹt the rising of the Sun is something that depends upon huge physical systems ly in action, which have been in place for a very long time, that have huge ı, and that are therefore predictable and dependable. The coin-flipping is an tially randomized act; the rising of the Sun is not. And remember that I carefully ɹuite probable," not "certain," for everything just might vanish ten minutes from That's quite improbable, I must add....

er writer, Sivar, scolded me for having an inaccurate number of Sun-risings in perience-span. I answered that I was once lost underground in a cave for two ; (not true, but the best I could come up with), and that I used 365.25 as the ɛr of days in a year, rather than the 365.25625 he used. Okay, if I'm going for ɔints of decimal accuracy, I should have used 365.26.... Picky, picky, picky! Of ɛ, I could get into the choice of a solar, sidereal, or anomalistic year — though not a lunar year.

von't.

ɛr Randall Boyce comments:

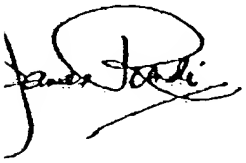
I am glad you pointed out in your "Survival Without Magic" article that the author wrote it 34 years ago. However, I was offended that you did

not mention the fact that the philos[illegible]f Political Correctness has been scientifically proven by some o[illegible]grea[illegible]nkers of our time like Jesse Jackson and Jane Fonda. Perhaps you[illegible]ed more Sensitivity training.

)S.....

---

being posted while I'm still in Italy. Since I'll be getting back barely in time to e a new page change, the next one may be a bit short....

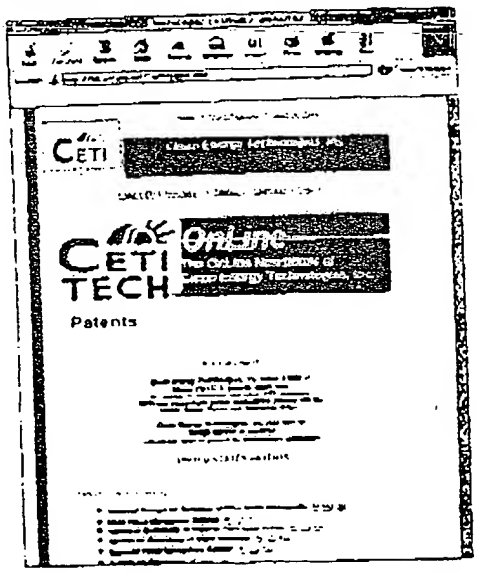


ıe Commentary archive.

Dozens of recent patents have been awarded for devices that invoke principles outside accepted science, such as exotic nuclear physics and psychic forces

'New Physics' Finds a Haven At the Patent Office

A famous cartoon shows a man waiting outside the Patent Office with a complicated gadget in his lap. He looks over and sees another man holding exactly the same contraption. The image reflects a common myth—that the government checks that an invention relies on accepted principles before granting a patent. But consider two recent patents: 5,616,219 and 5,628,886, issued to Clean Energy Technologies Inc. of Sarasota, Florida, for an electrochemical device that is claimed to put out more energy than is possible by chemistry alone. Or take Clean Energy's patent 5,672,259, for a process to transmute radioactive elements by electrochemistry. Physicists who have examined these patents say the claims resemble cold fusion; the company rejects that label but says its products do exploit "new nuclear physics." Either way, the devices would challenge some basic notions of modern physics if they worked as advertised. A cursory search of recent patents reveals dozens of others like them.



Selling points. A company developing "revolutionary" energy technology lists its patents.

Such patents confer prestige and legitimacy, attracting investment dollars and customers. "Having a patented device, with lots of fancy equations in the manual, that's partly why people take it seriously," says Keith Conover, a University of Pittsburgh physician who has studied a patented instrument said to be able to find buried disaster victims by "dielectrokinesis." Patents like those awarded to Clean Energies have also helped keep the cold-fusion field alive. Roundly scorned by the scientific establishment in the 10 years since Stanley Pons and Martin Fleischmann first said they had achieved fusion in a jar, claims of unlimited energy live on—albeit under other names—in the patent literature.

Most disturbing to some onlookers is the window such patents offer on the patent examination process. The U.S. Patent and Trademark Office (USPTO) is now staggering under an onslaught of patent applications. Its nearly 3000 examiners must process roughly 240,000 intellectual property claims every year, a number that is increasing by more than 8% annually because of increases in software and biotech applications. Says one former USPTO employee, "They are desperate and they're hiring like crazy." The office plans to add another 700 examiners in the coming year. And as Richard Maulsby, a PTO spokesperson, admits, "It is very difficult for us to do all this hiring and to maintain quality." The result, in some cases, is inspectors who have little experience—or are themselves devotees of fringe technology (see sidebar on p. 1254).

The Patent Office has long been besieged by inventors seeking patents on weird gadgets, and patent law is specifically written to restrict patents on one kind of device with perennial appeal, perpetual motion machines. Anyone who wants to patent such a mechanism has to submit a working model as part of his application. For most inventions, however, the bar is lower. Except for perpetual motion machines, "the Patent Office hasn't required a working model since the 19th century," says patent attorney Michael J. Colitz, the creator of the Wacky Patent of the Month Web page. Instead, patent law requires only that an invention be novel, nonobvious, and reducible to practice.

"Reducible to practice" sounds like "really works," but by clever wording, patent applicants can dodge tough scrutiny of how realistic an invention is. The trick is to avoid the perpetual motion label and others, such as "cold fusion," that might raise red flags for the patent examiner who searches prior patents and judges whether a patent claim makes sense. "Each patent examiner has different criteria," says Colitz.

And these days, sincere but poorly trained examiners are making many of those judgments, says patent consultant Greg Aharonian, editor of *Internet Patent News*. One examiner says he was interviewed over the phone by a supervisor. A few days later he got a package in the mail. "I thought it was an application," says the interviewee. "But it was a form confirming my acceptance of the position." The low salaries at the Patent Office don't help matters, say patent examiners and outsiders. "They have a variety of problems in not being able to retain good patent examiners because of the high salaries outside," says Aharonian. "You really have to be a patriot to want to work at the Patent Office."

Cold fusion rehested?

Inexperienced patent examiners may be one reason why some unlikely inventions—helped along by clever patent attorneys—have recently won patents. Although the Patent Office initially rejected cold-fusion patents after Pons and Fleischmann's memorable Salt Lake City-press-conference in 1989, some experts say the Clean Energy patents show that such patents are now slipping into the books. James Reding, Clean Energy's chief executive officer (CEO), insists that his company's technology is not "cold fusion," although he says it does exploit nuclear processes. But every physicist *Science* has asked about the Clean Energy patents, including IBM's Richard Garwin and William Happer of Princeton University, says they describe what are essentially cold-fusion devices. And the March/April 1999 issue of *Infinite Energy* magazine, a publication for cold-fusion buffs, includes Clean Energy work in its list of "Key Experiments that Substantiate Cold Fusion Phenomena."

The patents say that the devices generate excess heat by passing a current through a cell containing beads coated with a metal such as palladium and exposed to various hydrogen isotopes—the same setting where cold fusion was said to occur. Garwin and others say the devices are unlikely to prove viable, either as energy sources or as systems for rendering radioactive waste harmless. Conditions in an electrochemical cell fall far short of what is needed to trigger nuclear reactions, they note. "The cell has never produced any excess heat, in my judgment," says Garwin, who has looked at Clean Energy's data. "And this remediation of radioactive materials is incredible and has not been demonstrated." Reding responds that he knows the physics is controversial, but "the technology is very real."

Reding says that the company's first attempts to patent the devices failed because the applications went through the group of patent examiners who specialize in nuclear science. But he says that by carefully structuring another application, the company was able to steer the patent to a different group of examiners, who handle electrochemistry. "Our patent attorney was very helpful in this process," says Reding. Attempts to reach the examiners who approved the patents have been unsuccessful.

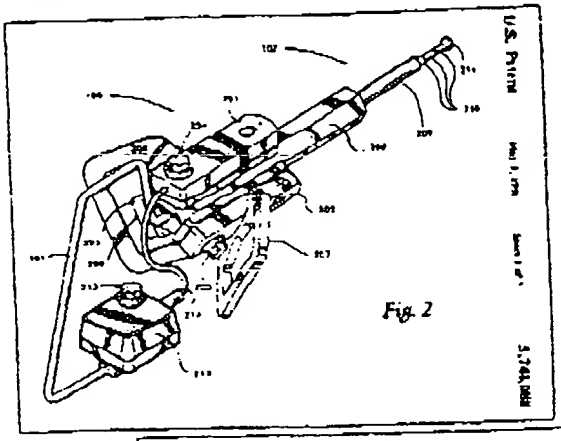
A check of the USPTO Web site (www.uspto.gov) also reveals other odd devices. Patent 5,830,064, for example, was granted to a company called Pear Inc. for an electronic gizmo that is meant to detect the skewing of a random signal caused by psychic forces. Pear Inc. is associated with PEAR, the Princeton Engineering Anomalies Research laboratory, which is run by Robert Jahn and Brenda Dunne, longtime parapsychology researchers who are named in the patent as co-inventors. According to the patent, the device could be used to detect the "volitional state of one or more persons" and could control games, computer displays, and appliances.

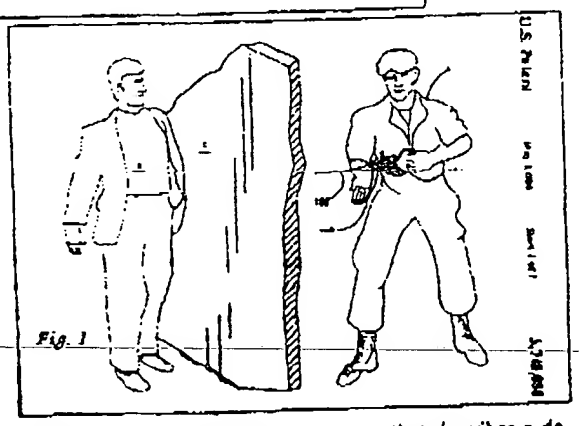
Pear Inc. has been renamed Mindsong Inc., and its Web page (www.mindsonginc.com) carries a press release about the patent, calling it the first patent for "devices responsive to intention of operators physically isolated from the device." Mindsong offers a product based on this "patented technology" that is claimed to control electrical devices plugged into ac outlets on the box, for $425.00 plus shipping and postage.

At first glance, says physicist Marc Sher of the College of William and Mary in Williamsburg, Virginia, the patent seems to that generates a random signal and other electronics for detecting anomalies. "You look at the title and the abstract and it looks okay," Sher says. "Then you look at the background information and the rest of it, and it goes off into ga-ga land." If this kind of psychic control worked, Sher notes, it would be the "biggest thing since Galileo. But it has never been confirmed."

Mindsong CEO John Haaland has an answer for the skeptics: "Well, they should buy it and try it." Haaland, a former vice president of the Pillsbury food company who has a Ph.D. in biophysics from the University of Minnesota, feels that the critics have not done their homework. "They should dig harder," he says. Haaland believes the forces at work are based on the "quantum coherence of living systems," which skeptics do not understand, he says. What's not in doubt is the value of the patent to his company. "It's a very important piece of our portfolio," he says. "We've been talking to investors, and the patent is a key part of our market strategy." Haaland says the company has sold 32 of his devices so far.

The examiner for that patent, George Manuel, explained in a telephone conversation that he normally works on medical devices, but because of the backlog he was temporarily assigned to work on patents for games and toys, which is how the Pear patent is classified. Manuel said he didn't find anything outrageous about the patent. "I feel comfortable that this one was issued," he said. "I assume that what is put forth is legitimate."





Telltale heart? Drawings from a patent that describes a device for finding intruders and disaster victims by picking up the heart's electric and magnetic fields.

Trust or verify

Then there is patent 5,748,088, granted for a device to locate "entities" by "dielectrokinesis." A product based on this patent is the LifeGuard system sold by DKL Inc. for the purpose of locating humans behind barriers. DKL says the LifeGuard can detect the electric and magnetic fields produced by a human heart at distances of up to 600 meters by means of a probe attached to a swivel mount. The LifeGuard products are currently being marketed for about $8000 each (operator training is extra) to law enforcement agencies and search-and-rescue teams for detecting intruders and locating disaster victims. DKL declined to release sales figures but said that "hundreds" of units are in use.

A group at Sandia National Laboratory in Albuquerque, New Mexico, however, concluded last year that the device is ineffective, based on double-blind performance tests as well as a "teardown" and physical analysis done at the request of the National Institute of Justice.* The Sandia group also examined DKL's scientific claims. According to a company brochure, the LifeGuard's probe swivels to point to a distant human body because of "dielectrophoresis," a term coined by University of Oklahoma physicist Herbert Pohl in the 1960s for the tendency of uncharged, highly polarizable materials to point toward the strongest part of a nonuniform electric field.

As most scientists understand it, however, dielectrophoresis is a weak effect seen only in powerful electric fields. When the Sandia group ran calculations using Pohl's own equations, they concluded that "there is no possibility that the DEP [dielectrophoresis] effect is responsible for the rotation of the antenna assembly." The executive summary of the physical analysis further concludes that the LifeGuard is not based on "dielectrophoresis or any other scientific principles as understood by the scientific and engineering community."

Conover, who is a 30-year veteran of search-and-rescue operations, says the Life-

* Sandia's physical analysis is available at nlectc.org/services/dklanalysis.html; the performance tests can be seen at www.prod.sandia.gov/cgi-bin/techlib/access-control.pl/1998/980977.pdf

A Free Energy Enthusiast Seeks Like-Minded Colleagues

One patent examiner is working to make the Patent Office more hospitable to fringe energy technologies, including cold fusion: Thomas Valone. Valone, who has worked for 4 years as a patent examiner and has a master's degree in physics, is also president of a Washington, D.C.–based outfit called the Integrity Research Institute (IRI), which advertises books and videos on antigravity, mind control, and unconventional energy sources on its Web site. In an e-mail message broadcast last year on Internet news groups dealing with fringe science, Valone called for "all able-bodied free energy technologists" to "infiltrate" the Patent Office. Valone also secured government sponsorship—it was later withdrawn—for an IRI-organized conference on cold fusion, tabletop nuclear transmutation, and various other unusual energy proposals.

Valone's e-mail message offered to accept résumés at his offices at IRI and to forward applications to the appropriate supervisor at the Patent Office. Valone says he is simply trying to spread the word about free energy devices, which he feels are misunderstood. And he was briefly successful in recruiting a kindred spirit, Paul LaViolette, who was hired last year and resigned from the Patent Office on 9 April. According to the October 1998 issue of the *Unofficial Gazette*, a newsletter of the Patent Office employees' professional society, LaViolette's interests include assertions that antigravity technology was incorporated into the design of the B2 bomber and that the Sphinx is a 16,000-year-old cosmological cryptogram.

LaViolette confirms that Valone helped recruit him and says the *Unofficial Gazette*'s portrait of his interests is accurate. He did not issue any patents during his short tenure, and those issued by Valone appear to be for conventional terrestrial technology. But conventional science was not the focus of the IRI's First International Conference on Free Energy. IRI persuaded the State Department last year to include its conference in the department's Open Forum program, a prestigious venue for discussions of issues in foreign policy, then promptly sent out notices in official government envelopes.

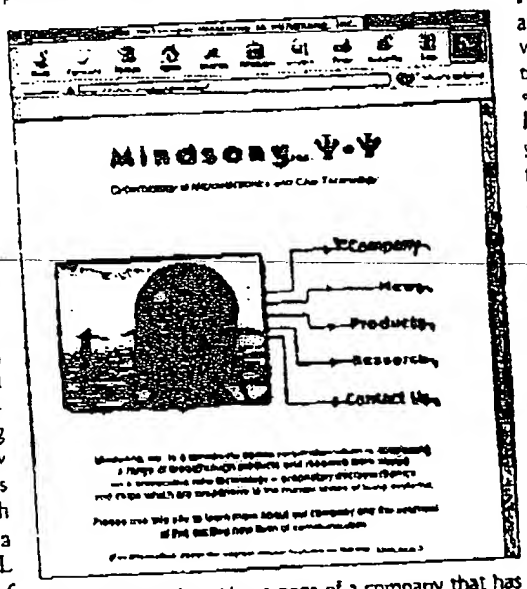
After Bob Park of the American Physical Society wrote about the meeting in his tart e-mail newsletter, *What's New*, the red-faced State Department insisted on having the papers peer reviewed. None of the dozen or so talks passed muster. "The papers ranged from the mediocre to the truly weird," says a physicist at the State Department who was involved in carrying out the peer review. "Not one of them showed any understanding of modern science." As a result, the State Department did not host the Conference on Free Energy.

But the conference was not canceled. At first, Valone moved the meeting to the Department of Commerce, where as a department employee he was able to reserve an auditorium. The meeting title was changed to the Conference on Future Energy, still hosted by IRI but advertised as being "under the auspices" of the Commerce Department. When Commerce senior staff learned of the conference, permission for use of the auditorium was withdrawn. The meeting took place at the end of April at a hotel in Bethesda, Maryland. –D.V.

Guard is essentially a fancy dowsing rod. "It is clearly based on magical thinking and not scientific thinking." He says many search-and-rescue teams are financially strapped. "This expense could wipe out some units," he complains, "and it takes resources away from proven methods."

DKL President Howard Sidman says the company stands by the product and that the critics do not understand the device. "The [Sandia] report is—rubbish," says DKL chief engineer Bob VanDine. Spokesperson Nancy Wolcott says that the performance testing did not follow the operator's manual, although both the Sandia report and DKL say that one of DKL's employees was the operator for the test. DKL claims that its own analysis of the Sandia data and testing by other labs hired by the company show that the product is reliable. Further, says DKL, testing by a security company in Belgium and a crime-prevention group in Los Angeles gave 100% success rates. Wolcott claims that Sandia has a conflict of interest because the lab is trying to sell its own sensor technology.

The examiner who handled this patent, Nina Tong, said that her job is to check and see if the claims are covered by previous patents. "I tried to look up 'dielectrokinesis,' but I couldn't find it," she says. "I trusted them that it works as they claimed, and I assumed that people skilled in the art would use this word all the time." Tong is an assistant examiner with a couple of years' experience at the PTO and a bachelor's degree in electrical engineering. The primary examiner who signed off on the patent, Thomas Mullen, said that he typically gives the application only a quick look to make sure all the parts are filled out.



Read my thoughts. Home page of a company that has patented a device it says can respond to psychic forces.

CREDIT: MINDSONG; ILLUSTRATION: DAN HANDSCHUH-CREMENS

Aharonian says that the problem goes beyond inexperienced patent examiners to the pressure to process paper for what USPTO calls its "customers"—the patent applicants—which leaves little room for quality control. "The big betrayal at USPTO," says Aharonian, "is that they forget they have two customers: the applicants, and the American people on whose behalf the applicants are granted monopoly rights." One examiner, who requested anonymity, says that priorities have shifted at the Patent Office. "When I started several years ago, we were told 'When in doubt, reject.' But now, it's 'When in doubt, issue the patent.'"

Nicholas Godici, the deputy assistant commissioner for patents, refused to comment on any specific patent and denied that examiners were being hired over the phone. He added that he was satisfied with the patent-examination process. Moreover, he said, the USPTO doesn't check inventions to see that they work. "We assume the information provided in an application is accurate. We don't have lab facilities or do testing, but we may ask for additional data from the inventor," he said.

Godici concedes that the public views patents as a stamp of approval but says that's a misunderstanding. Patents are nothing more than "a legal right to exclude others from using or profiting from an invention." Yet Clean Energy's Reding says they carry an additional cachet. "We've raised $5 million from investors," he says. "The fact that the U.S. Patent Office has declared your invention novel and unique is clearly valuable." –DAVID VOSS

-- PTO MEMORANDUM FOR ALL EMPLOYEES: MEDIA CONTACT POLICY

Posted Date: 06/25/99
Removal Date: 07/06/99

E

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
ASSISTANT SECRETARY AND COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

June 22, 1999

99-42

MEMORANDUM FOR All Employees

FROM: Acting Assistant Secretary of Commerce and Acting Commissioner of Patents and Trademarks

SUBJECT: Media Contact Policy

Since a memorandum on this subject was first issued several years ago, thousands of new employees have joined the PTO. Therefore, it is a good time to reiterate PTO policy concerning employee contact with members of the media including, but not limited to, those in print, broadcast, cable and online publications.

All requests, including telephone and e-mail, from members of the media for interviews, tours, and appearances should be directed to the Office of Public Affairs (Richard Maulsby or Brigid Quinn). Public Affairs will then determine the appropriate Office response for such requests and arrange for all interviews and any other meetings with the media. A member of the Public Affairs staff may attend interviews and meetings.

This policy applies only to contact with the media, not to interactions with customers. Any questions about media contact should be directed to the Office of Public Affairs at 305-8341.

Additionally, MPEP section 1701 and TMEP section 1801 specify that Office personnel should not comment on the validity or enforceability of any U.S. patent or trademark registration. These sections also caution employees about answering other particular inquiries concerning U.S. patents or trademark registrations. Any questions on this policy should be directed to your supervisor or to the MPEP Editor at 305-8813 for patents or to the Office of the Assistant Commissioner for Trademarks at 308-8900.

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARK
Washington, D.C. 20231

APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.

Serial Nos.: (09 Series)

009,837 008,947 009,294
110,160 110,694 110,717
009,455 110,678 111,003
501,622 225,687 362,693

EXAMINER	
ART UNIT	PAPER NUMBER

DATE MAILED:

INTERVIEW SUMMARY

All participants (applicant, applicant's representative, PTO personnel): (Applics representatives) J. Melcher. J. Smenauer, R. Mills, S. Brewer

(1) W. Langel (exr) (3) V. Jagannathan (consultant)

(2) S. Kalafut (exr) (4) S. Griffin (SPE)

Date of Interview 2/21/01 D. Turner & S. Walsh (Observers); H. Sastelle

Type: ☐ Telephonic ☐ Televideo Conference ☒ Personal (copy is given to ☐ applicant ☐ applicant's representative).

Exhibit shown or demonstration conducted: ☒ Yes ☐ No If yes, brief description: Slideshow & an attachment

Agreement ☐ was reached. ☐ was not reached.

Claim(s) discussed: All

Identification of prior art discussed:

Description of the general nature of what was agreed to if an agreement was reached, or any other comments: Applicant clarified his theoretical viewpoint. Slide show referred to experimental data. Examiners advised that evidence must be submitted with the amendment in response to the outstanding office action. Applicant asked that an attachment be included.

(A fuller description, if necessary, and a copy of the amendments, if available, which the examiner agreed would render the claims allowable must be attached. Also, where no copy of the amendments which would render the claims allowable is available, a summary thereof must be attached.)

☐ It is not necessary for applicant to provide a separate record of the substance of the interview.

Unless the paragraph above has been checked to indicate to the contrary. A FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION IS NOT WAIVED AND MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has are ready been filed, APPLICANT IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW.

Examiner Note: You must sign this form unless it is an attachment to another form.

ATTACHMENT TO INTERVIEW SUMMARY

Counsel for applicant requested disclosure of the following information as being reasonably related to the prosecution of the pending patent applications:

1) Identification of all Examiners and/or other Patent Office personnel, other than those identified in the pending Office Actions, ~~who were~~ were consulted, or otherwise provided input, in the formulation of the rejections of record;

2) Identification of all outside consultants and/or other technical personnel, including, but not limited to, those of NIST, who were consulted, or otherwise provided input, in the formulation of the rejections of record;

3) Identification of all Patent Office officials responsible for the withdrawal of Appn Ser. No. 009,294 from issuance, and clarification of the factual circumstances surrounding that withdrawal; and

4) Identification of any and all outside sources of information that may have precipitated, or otherwise contributed to, the Patent Office's withdrawal of Appn. Ser. No. 009,294 from issuance.

The Patent office disagrees with Applicant's counsel that the above-identified information requested at the Interview is germane to the issues raised in the pending Office Actions. The Patent office, therefore, ~~will not~~ refused to respond to these lines of inquiry during the Interview.

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARK
Washington, D.C. 20231

APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
09/501622	09/111003	Mills	
09/678730	09/501621		
09/009837	09/225687		
09/110678	10/076590		
09/111160	09/813792		
09/362693			
09/009455			
09/669877			

EXAMINER	
W. A. Langel	
ART UNIT	**PAPER NUMBER**
1754	

DATE MAILED:

INTERVIEW SUMMARY

All participants (applicant, applicant's representative, PTO personnel):

(1) Mr. Melcher (3) Examiner Kalafut

(2) Examiner Langel (4) D. Mills

Dat of Interview 2-11-03 (5) Mr. Simmauer

Type: ☐ Telephonic ☐ Televideo Conference ☑ Personal (copy is given to ☐ applicant ☑ applicant's representative).

Exhibit shown or demonstration conducted: ☒ Yes ☐ No If yes, brief description: _____

Agreement ☐ was reached. ☒ was not reached.

Claim(s) discussed: all

Identification of prior art discussed: none

Description of the general nature of what was agreed to if an agreement was reached, or any other comments: Dr. Mills presented comparisons of the novel hydrogen, as well as some known energy Hydrogen. He also gave the patentee's article entitled "Novel Catalytic Reaction of Hydrogen on Potential New Energy Source" from R&E (cont. page 2)

(A fuller description, if necessary, and a copy of the amendments, if available, which the examiner agreed would render the claims allowable must be attached. Also, where no copy of the amendments which would render the claims allowable is available, a summary thereof must be attached.)

☐ It is not necessary for applicant to provide a separate record of the substance of the interview.

Unless the paragraph above has been checked to indicate to the contrary. A FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION IS NOT WAIVED AND MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has are ready been filed, APPLICANT IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW.

Examiner Note: You must sign this form unless it is an attachment to another form.

FORM PTOL-413 (REV. 2-98)

Page 1 of 4

Wayne A. Langel

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARK
Washington, D.C. 20231

APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
09/501,622		Mills	

EXAMINER	
W. H. Langel	
ART UNIT	PAPER NUMBER
1754	

DATE MAILED:

INTERVIEW SUMMARY

All participants (applicant, applicant's representative, PTO personnel):

(1) Stanley Silverman (3) Ted Liu

(2) Pat Ryan (4) Mr. Brewer

(5) Examiner Wayne Langel

Date of Interview

Type: ☐ Telephonic ☐ Televideo Conference ☐ Personal (copy is given to ☐ applicant ☐ applicant's representative).

Exhibit shown or demonstration conducted: ☐ Yes ☐ No If yes, brief description:

Agreement ☐ was reached. ☐ was not reached.

Claim(s) discussed:

Identification of prior art discussed:

Description of the general nature of what was agreed to if an agreement was reached, or any other comments: (cont. from pg 1) Allamon National Laboratory which is attached hereto. See also the attachment.

(A fuller description, if necessary, and a copy of the amendments, if available, which the examiner agreed would render the claims allowable must be attached. Also, where no copy of the amendments which would render the claims allowable is available, a summary thereof must be attached.)

☐ It is not necessary for applicant to provide a separate record of the substance of the interview.

Unless the paragraph above has been checked to indicate to the contrary. A FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION IS NOT WAIVED AND MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has are ready been filed, APPLICANT IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW.

Examiner Note: You must sign this form unless it is an attachment to another form.

FORM PTOL-413 (REV. 2-98)

Wayne A. Langel

2/13/03

ATTACHMENT TO INTERVIEW SUMMARY FORM

Applicant requested that the following points discussed at the Interview held on February 11, 2003 be included as an Attachment to the Interview Summary Form.

Applicant's counsel and the Examiner in attendance at the Interview agreed to meet again at a future date, either in person or by telephone, to continue discussions regarding the patentability of Applicant's pending patent applications. Specifically, the Examiner expressed concern that the Applicant's experimental evidence be commensurate with the scope of the claims. To address that concern, Applicant's counsel agreed with the Examiner to go through the patent application claim-by-claim with the Examiner and demonstrate how the scientific data supports those claims.

page 3 of 4

Wayne G. Langel

For those claims that are supported by the data, the PTO agrees to issue those claims. For those claims that the PTO determines are not supported by the data, Applicant will continue to seek that broader claim coverage in subsequent proceedings.

Wayne A. Langel

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/362,693	07/29/1999	RANDELL L. MILLS	62-226-9A	7170

20736 7590 02/26/2003

MANELLI DENISON & SELTER
2000 M STREET NW SUITE 700
WASHINGTON, DC 20036-3307

EXAMINER	
LANGEL, WAYNE A	

ART UNIT	PAPER NUMBER
1754	24

DATE MAILED: 02/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

SERIAL NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.

EXAMINER	
ART UNIT	PAPER NUMBER
	24

DATE MAILED:

Please find below a communication from the EXAMINER in charge of this application.

Commissioner of Patents

Attached hereto is a "Supplement to Interview Summary" concerning the February 11, 2003 interview for Serial Nos. 09/501,622; 09/678,730; 09/009,837; 09/110,678; 09/111,160; 09/362,693; 09/009,455; 09/669,877; 09/111,003; 09/501,621; 09/225,687; 10/076,590; and 09/813,792.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wayne A. Langel whose telephone number is (703) 308-0248. The examiner can normally be reached on Monday through Friday from 8 A.M. to 3:30 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman, can be reached on (703) 308-3837. The fax phone number for this Group is (703) 305-7718.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-2351.

WAL:cdc
February 20, 2003

Supplement to Interview Summary

The following is a supplement to the summary concerning the February 11, 2003 interview re 09/501,622, etc. The attendees were Mr. Melcher, Examiner Langel, Examiner Kalafut, Dr. Mills, Mr. Simenauer, SPE Stanley Silverman, SPE Pat Ryan, Congressional Aid Ted Liu, Mr. Brewer, Examiner Wayner, and QAS Douglas McGinty. A two-page Interview Summary was provided by Examiner Langel. A two page "Attachment to Interview Summary Form" also was provided by Mr. Simenauer. While the Attachment may represent the applicant's understanding of the interview, two points must be clarified.

First, the second page of the applicant's attachment states in part: "For those claims that are supported by the data, the PTO agrees to issue those claims." The PTO made no such agreement. Instead, the PTO representatives indicated that the rejections under both 35 USC 101 and 112, 1st para., are outstanding and that evidence as to verification by credible, established, independent third parties would carry more persuasive weight.

Second, QAS Douglas McGinty was not listed in the Examiner's Interview Summary. He was present during the interview with the aforementioned attendees.

Wayne Langel
Primary Examiner
Art Unit 1754

WAYNE A. LANGEL
PRIMARY EXAMINER

UNITED STATES
PATENT AND
TRADEMARK OFFICE

Commissioner for Patents
Washington, DC 20231
www.uspto.gov

FEB 20 2003

Dear Patent Business Customer:

The United States Patent and Trademark Office ("Office") is now permitting and encouraging applicants to voluntarily submit amendments in a revised format as set forth in *AMENDMENTS IN A REVISED FORMAT NOW PERMITTED*, ____ *Off. Gaz. Pat. Office* __ (February 25, 2003), currently available on the USPTO web site at **http://www.uspto.gov/web/offices/pac/dapp/opla/preognotice/revamdtprac.htm**. The revised format permits amendments to the specification and claims to be made in a single marked-up version; the requirement for a clean version is eliminated. Attached, you will find a flyer with information and instructions regarding the procedures to be used to comply with the revised format. The flyers are being inserted with out-going Office actions mailed during the period of February 20, 2003 - March 31, 2003.

The revised amendment format is essentially the same as the amendment format for the specification, claims, and drawings that the Office is considering adopting via a revision to 37 CFR 1.121 (Manner of Making Amendments). The revision to 37 CFR 1.121 (if adopted) will simplify amendment submission and improve file management. This proposed revision and others necessary to facilitate a gradual transition to the use of an Electronic File Wrapper (EFW) will be set forth in a Notice of Proposed Rule making (NPR), expected to be published by March 2003. After consideration of public comments, the Office anticipates adopting a revision to § 1.121, following publication of a Notice of Final Rule making (NFR), expected by June 2003, at which point compliance with revised § 1.121 will be mandatory.

The Office will continue to accept your amendment submissions in the revised format during the voluntary period, which will extend up to the effective date of final revisions to § 1.121. The Office also encourages your feedback on the proposed revised amendment format and other changes set forth in the NPR, expected to be published by March 2003.

For assistance: Any questions regarding the submission of amendments pursuant to the revised practice should be directed to Office of Patent Legal Administration (OPLA), Legal Advisors Elizabeth Dougherty (**Elizabeth.Dougherty@uspto.gov**), Gena Jones (**Eugenia.Jones@uspto.gov**) or Joe Narcavage (**Joseph.Narcavage@uspto.gov**). Alternately, you may send e-mail to "Patent Practice", the OPLA e-mail address that has been established for receiving queries and questions about patent practice and procedures or telephone OPLA at (703) 305-1616.

Nicholas P. Godici

Nicholas P. Godici
Commissioner for Patents

Attachment: Flyer entitled: *Revised Notice* AMENDMENTS MAY NOW BE SUBMITTED IN REVISED FORMAT*

UNITED S[illegible] DEPARTMENT OF COMMERCE
Patent and T[illegible]mark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARK
Washington, D.C. 20231

APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
09/110678	7-7-98	M. Ills	
09/362693			

EXAMINER	
W.A. Langel	
ART UNIT	**PAPER NUMBER**
1754	35

DATE MAILED:

INTERVIEW SUMMARY

All participants (applicant, applicant's representative, PTO personnel):

(1) Mr Melcher (3) Examiner Langel

(2) Mr. Simenauer (4)

Date of Interview 4-14-03

Type: ☐ Telephonic ☐ Televideo Conference ☒ Personal (copy is given to ☐ applicant ☒ applicant's representative).

Exhibit shown or demonstration conducted: ☐ Yes ☐ No If yes, brief description:

Agreement ☐ was reached. ☒ was not reached.

Claim(s) discussed: all

Identification of prior art discussed: none

Description of the general nature of what was agreed to if an agreement was reached, or any other comments: The parties presented data establishing presence of lower virgin hydrogen. Some of the data appeared to be using work in the file, and participants stated they would submit such data separately independent (continued p. 2)

(A fuller description, if necessary, and a copy of the amendments, if available, which the examiner agreed would render the claims allowable must be attached. Also, where no copy of the amendments which would render the claims allowable is available, a summary thereof must be attached.)

☐ It is not necessary for applicant to provide a separate record of the substance of the interview.

Unless the paragraph above has been checked to indicate to the contrary. A FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION IS NOT WAIVED AND MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has are ready been filed, APPLICANT IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW.

Examiner Note: You must sign this form unless it is an attachment to another form.

Wayne A. Langel

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARK
Washington, D.C. 20231

APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
09/119678			
09/362693			

EXAMINER	
ART UNIT	PAPER NUMBER

DATE MAILED:

INTERVIEW SUMMARY

All participants (applicant, applicant's representative, PTO personnel):

(1) _____ (3) _____

(2) _____ (4) _____

Date of Interview _____

Type: ☐ Telephonic ☐ Televideo Conference ☐ Personal (copy is given to ☐ applicant ☐ applicant's representative).

Exhibit shown or demonstration conducted: ☐ Yes ☐ No If yes, brief description: _____

Agreement ☐ was reached. ☐ was not reached.

Claim(s) discussed: _____

Identification of prior art discussed: _____

Description of the general nature of what was agreed to if an agreement was reached, or any other comments: (Cont. from p. 1)
It was the # 45 and # 44 on page 25 of the
last Response.

(A fuller description, if necessary, and a copy of the amendments, if available, which the examiner agreed would render the claims allowable must be attached. Also, where no copy of the amendments which would render the claims allowable is available, a summary thereof must be attached.)

☐ It is not necessary for applicant to provide a separate record of the substance of the interview.

Unless the paragraph above has been checked to indicate to the contrary. A FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION IS NOT WAIVED AND MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has are ready been filed, APPLICANT IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW.

Examiner Note: You must sign this form unless it is an attachment to another form.

FORM PTOL-413 (REV. 2-98)

Wayne A. Langel

[redacted] Tel 202.261.1000
Washington, D.C. 20036-3307 Fax 202.887.0336

FARKAS & MANELLI PLLC
ATTORNEYS

February 28, 2000

VIA HAND-DELIVERY

Ms. Esther Kepplinger
Director of Group 1700
United States Patent & Trademark Office
Washington, D.C. 20231

Re: Improper Withdrawal From Issuance of
U.S. Patent Application Ser. No. 09/009,294

Dear Ms. Kepplinger:

This letter is a follow-up to our telephone conversations of last week concerning recent actions taken by the U.S. Patent and Trademark Office, which, as indicated in the attached February 17, 2000 Notice from the Office of Petitions, has resulted in the withdrawal from issuance of Patent Application Ser. No. 09/009,294. This application was due to issue as U.S. Patent No. 6,030,601 on February 29, 2000.

As I understand it, these actions were based on U.S. Patent Office concerns that the technology developed by inventor Dr. Randell L. Mills and disclosed in the subject patent application, and perhaps in other allowed applications and a prior issued patent of Mills, represents "unproven science," such as "cold fusion." I am writing to allay those concerns and to assure you that they are unfounded inasmuch as this technology has been subject to extensive testing and proven beyond argument to work. The results of that testing have already been presented and positively considered by the U.S. Patent Office and embraced by highly reputable companies, not to mention the U.S. Navy and the American Chemical Society.

Before proceeding any further, let me just say that I appreciate the courtesy you extended in taking my calls inquiring into this matter and the circumstances surrounding this rather unusual turn of events. I gathered from your comments that you share my desire to resolve this matter as directly and expeditiously as possible, and it is my sincere hope that this letter, as the first step in that process, will convince you that there is no need for further examination of the '294 patent application and that it should be immediately allowed to issue.

As I stated during our conversations, this application, as well as the other allowed Mills applications assigned to my client, Blacklight Power Inc., represents a significant advance in the

chemical arts. The underlying technology disclosed in these applications is the culmination of over ten years of research and the expenditure of over ten million dollars invested by well-known companies, such as AMP Corporation, Connectiv, and PacificCorp, companies that would not dare risk their business reputations on "unproven science."

To be sure, Dr. Mills' technology has undergone rigorous testing by over 25 well-known independent laboratories and has been shown to be based on sound scientific principles and, more importantly, shown to work precisely as described in Mills' '294 patent application. Based on his startling discoveries, Dr. Mills was bestowed the honor of addressing the October 1999 meeting of the American Chemical Society (ACS) in California, during which he presented to an enthusiastic and receptive audience the test results for the very compounds disclosed and claimed in that application. Also a featured speaker at this meeting was Dr. Johannes Conrads, retired Director and Chairman of the Board of the Institute for Low Temperature Plasma Physics at Ernst Moritz Arndt University in Greifswald, Germany. Dr. Conrads, considered by many to be one of Germany's top physicists, tested the Mills technology himself and reported to the ACS that it produced an energetic plasma in hydrogen with no power input, conclusively demonstrating a new source of chemical energy from hydrogen never before seen. Dr. Conrads, and the four other top scientists who assisted in this testing, would not put their professional reputations in jeopardy for the sake of "unproven science."

These positive test results also have not escaped the attention of the U.S. Government. Following a thorough review, the United States Navy has taken affirmative steps to develop applications based on the Mills technology in cooperation with Blacklight Power.

In view of the allowance of this and other patent applications of Dr. Mills, the issuance of U.S. patent No. 6,024,935 to Dr. Mills, and other highly-desirable commercial applications of the Mills technology, Blacklight Power's management has committed to the process of going public and has limited its choice of underwriter to either Morgan Stanley or Goldman Sachs, two of Wall Street's top investment firms who also share an interest in carefully guarding their business reputations. Indeed, this process is now in the latter stages, with the filing statement for the IPO scheduled for late March. The market capitalization for this public offering is expected to exceed one billion dollars based on current market conditions. Blacklight Power's current private market capitalization is already in excess of 340 million dollars, based on the last private placement that was oversubscribed.

This enthusiastic public response to Blacklight Power and the revolutionary technology it developed did not just happen by chance. The company has been built upon a rock solid foundation of top-notch scientists and leaders in chemistry and physics. Included among the distinguished board members of Blacklight Power are: Dr. Shelby T. Brewer, M.S. and PhD. degrees from MIT in Nuclear Engineering, former Assistant Secretary of the Department of Energy and former Chief Executive Officer of Combustion Engineering's Nuclear Business; George A. Sawyer, former Assistant Secretary of the Department of Navy; David Blake presently with Connectiv and formerly a top manager with Du Pont and Hurcules Chemical Specialties

Company; and Michael P. Kalleres, former President and CEO of Global Associates, Ltd., Technology Services Group, and retired Vice Admiral from the U.S. Navy, currently serving on the Defense Science Board, the Naval Studies Board of National Academy of Science, and the Dean's Advisory Council of Purdue University. Furthermore, many of the shareholders of Blacklight Power are Phd. chemists and physicists. Certainly, the U.S. Patent Office does not believe that this impressive list of PhD. chemists and physicists associated with Blacklight Power would waste their money and efforts on "unproven science."

No doubt, therefore, you can appreciate the significant negative impact the PTO's withdrawal of the '294 patent application from issuance has had not only on Blacklight Power, but on many other players in the industry, including the U.S. Government, who have a vested interest in seeing that the Mills technology is not just commercially developed, but also adequately protected against piracy. Thus, you can understand my utter dismay when you informed me that this application had been "pulled" based on some perceived "heat" (from an undisclosed source) without reviewing the file history. As with any revolutionary technology, such negative reactions should not be surprising and, indeed, should be expected. I would hope that the Patent Office would not act "willy-nilly" upon some unfounded conclusions drawn without adequate evidentiary basis.

I was also disturbed by Director Robert Spar's comment to me that he directed Petitions Examiner Frances Hicks to issue the petition to withdraw the subject patent application from issuance based on the premise that the underlying technology involved "cold fusion." With all due respect, that assertion is baseless and utter nonsense since the subject patent application is directed to chemical compositions of stable matter rather than a nuclear reaction process. The distinction between stable chemical compounds and a nuclear reaction process should be obvious to any competent chemist and such a determination was in fact made by the U.S. Patent Office.

One such competent chemist, Primary Examiner Steven Kalafut, evaluated over 130 published "cold fusion" articles during prosecution of the subject patent application, as evidenced by the extensive initialed Form PTO/SB/08A and B documents, and it was certainly clear to him that the subject application is not related to cold fusion. Examiner Kalafut was advised by the undersigned during a personal interview that these immaterial "cold fusion" publications were being submitted in the subject application only because they were previously cited by Examiner Harvey Behrend of Group 3641 in an earlier application by Dr. Mills. Steven Kalafut also withdrew a Section 101 rejection of the subject application based on inoperability after Dr. Mills personally submitted convincing experimental evidence by unbiased third party physicists and chemists that the subject patent application is operable.

Another competent chemist, Primary Examiner Wayne Langel, also examined the over 130 published "cold fusion" articles during prosecution of another patent application and allowed that application to issue as U.S. Patent No. 6,024,935. Examiner Langel was also advised by the undersigned during a personal interview that these immaterial "cold fusion" publications were

being submitted only because they were previously cited by Examiner Harvey Behrend of Group 3641 in an earlier application by Dr. Mills.

The '935 patent, prior to issuance, is believed to have been subject to another level of review and approved by the Office of Patent Quality Review. This belief is based on the fact that the application was sent back to Examiner Langel to correct a very minor mistake in claim 304, line 1 to replace "304" with - - 303 - - after the application was forwarded to the Patent Publication Branch. Furthermore, the patent issued more than ten months after payment of the issue fee, allowing more than sufficient time for U.S. Patent Office to review the '935 patent before issuance.

I must say that I was also somewhat taken aback by your statement that you had no evidence that the invention disclosed in the subject '294 application was inoperable. In spite of this lack of evidence, you also stated that you believed the invention was inoperable because you learned in a textbook that "atomic hydrogen" cannot go below the "ground state." We acknowledge that atomic hydrogen having the ground state of 13.6 eV can only exist in a vacuum or in isolation, and that atomic hydrogen cannot go below this ground state in isolation. However, please keep in mind that there is no known composition of matter containing hydrogen in the ground state of 13.6 eV. When hydrogen reacts with another element, it goes to a lower energy state. Dr. Mills has discovered new compositions of matter containing hydrogen at new lower energy levels, which lower energy levels are achieved using the novel catalysts disclosed in the subject patent application. Over forty new compounds have been produced using Dr. Mills technology which exhibit novel, commercially valuable properties. The existence of the new lower energy level hydrogen has been established by well known analytical chemistry methods including Nuclear Magnetic Resonance Spectroscopy, Time of Flight Secondary Ion Mass Spectroscopy, and X-Ray Photoelectron Spectroscopy conducted by unbiased third parties. Primary Examiners Kalafut and Langel have fully evaluated this extensive experimental data.

To distinguish the new lower energy level hydrogen from conventional energy level hydrogen, Dr. Mills has named the new lower energy level hydrogen "hydrinos." "Hydrino" is latin for smaller or tighter bound hydrogen. The subject patent application describes and claims novel chemical compositions of matter comprising hydrinos. Please be assured that absolutely no nuclear "cold fusion" reactions are occurring in the formation of the hydrinos.

The U.S. patent system worked precisely as intended in the issuance of U.S. Patent No. 6,024,935 and the Notice of Allowances in five U.S. patent applications of Dr. Mills, including the subject application. The issued '935 patent and the five allowed patent applications were objectively and fairly examined by experienced Primary Examiners Kalafut and Langel on all of the surrounding facts, including "cold fusion" accusations. When I inquired about the '935 patent and these other allowed applications, Director Spar also informed me that the '935 patent will most likely be Reexamined by the U.S. Patent Office and petitions for withdrawal from issuance will be filed in the other four allowed applications of Dr. Mills. To overturn the objective examination of these applications by two experienced, chemical Primary Examiners

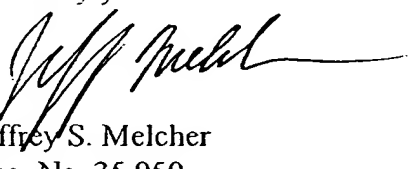
based on a whim and unsubstantiated "cold fusion" accusations by unnamed parties undermines the integrity of the U.S. Patent Office and, indeed, the entire U. S. patent system.

In an effort to better understand the underlying basis for the PTO's actions and to bring this matter to a swift conclusion, we respectfully request a meeting with you and whoever else you deem to be appropriate, to discuss this matter further before any Office Actions are issued in the subject '294 patent application or in any other presently allowed application, and before any Reexamination of the '935 patent that would drag this matter out before the public.

Since the U.S. Patent Office was unable to locate a copy of the prosecution history for the subject patent application as of February 25, 2000, more than one week after Ms. Hicks signed the petition, we have enclosed a courtesy copy of our prosecution file history for your review in this matter.

Thank you for your attention to this matter and we look forward to your prompt reply.

Sincerely yours.



Jeffrey S. Melcher
Reg. No. 35,950
Tel. No.: 202.261.1045

Attachments

Cc: The Honorable Todd Dickinson - Commissioner of Patents
Robert Spar - Director of Special Programs
Francis Hicks - Petitions Examiner
Stephen Kalafut – Primary Examiner Group 1700
Wayne Langel – Primary Examiner Group 1700

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
ASSISTANT SECRETARY AND COMMISSIONER OF
PATENTS AND TRADEMARKS
Washington, D.C. 20231

FMH.2

Paper No.

FARKAS & MANELLI, PLLC
2000 M STREET NW
7TH FLOOR
WASHINGTON, DC 20036-3307

COPY MAILED

FEB 17 2000

SPECIAL PROGRAMS OFFICE
DAC FOR PATENTS

In re Application of :
Randell L. Mills :
Application No. 09/009,294 :
Filed: January 20, 1998 :
Attorney Docket No. 911319 :

NOTICE

The purpose of this communication is to inform you that the instant application, which has received Patent No. 6,030,601 and an issue date of February 29, 2000, is being withdrawn from issue pursuant to 37 CFR 1.313.

The application is being withdrawn to permit reopening of prosecution. This withdrawal was requested by the Director, Special Program Law Office.

The issue fee is refundable upon written request. However, if the application is again found allowable, the issue fee can be applied toward payment of the issue fee in the amount identified on the new Notice of Allowance and Issue Fee Due upon written request. This request and any balance due must be received on or before the due date noted in the new Notice of Allowance in order to prevent abandonment of the application.

This application, upon receipt in the Office of Petitions, will be forwarded to Technology Center AU 1745 for reopening of prosecution.

Telephone inquiries concerning this matter may be directed to the undersigned at (703) 305-8680.

Frances Hicks

Frances Hicks
Petitions Examiner
Office of Petitions
Office of the Deputy Assistant Commissioner
for Patent Policy and Projects

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
ASSISTANT SECRETARY AND COMMISSIONER
OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

EIC

COPY MAILED

MAR 22 2000

SPECIAL PROGRAMS OFFICE
DAC FOR PATENTS

PARKAS & MANELLI PLLC
2000 M STREET NW
7th FLOOR
WASHINGTON DC 20036-3307

Paper No. 26

In re Application of
Mills et al.
Application No. 09/009,294
Filed: January 20, 1998
For: HYDRIDE COMPOUNDS

DECISION ON PETITION

This is in response to three communications submitted on February 28, 2000, regarding the application No. 09/009,294, requesting that the Commissioner review the action of the Director, Special Programs Law Office, with respect to the withdrawal of this application from issue. Although the three letters fail to clearly identify the submissions as a formal petition under 37 CFR 1.181 requesting the Commissioner to invoke his supervisory authority, the submissions are being treated as a single petition under 37 CFR 1.181(a)(3). The three letters are: (1) a February 28, 2000, letter to the Commissioner; (2) a February 28, 2000, letter to Director Spar; and (3) a February 28, 2000, letter to Director Kepplinger.

The petition is denied.[1]

BACKGROUND

A Notice of Allowance and Issue Fee due was mailed in the above-identified application October 18, 1999, which set a statutory period of three months to pay the issue fee.

On October 22, 1999, the PTO processed applicant's issue fee payment, and the application in due course was assigned a patent No. (6,030,601) and an issue date of February 29, 2000.

On February 15, 2000, U.S. Patent No. 6,024,935 (the `935 patent), titled "Lower Energy Hydrogen Methods and Structures," issued to the assignee Blacklight Power, Inc., which patent named Randell Mills et al. as the inventors.

[1] This decision may be viewed as a final agency action within the meaning of 5 U.S.C. § 704 for purposes of seeking judicial review. See MPEP 1002.02.

[redacted]

On February 17, 2000, the Director of the Technology Center (Director) which had examined the application that issued as the `935 patent, learned that the `935 patent had issued.

Shortly thereafter, upon inspecting the `935 patent, the Director read, *inter alia*, that the invention therein was asserted to relate to the discovery that energy was released by stimulating hydrogen atoms to relax, and, in so doing, to shrink to smaller radii, and to also attain energy levels below their "ground state" according to a "novel atomic model." The Director was immediately struck by the assertion that the electron of a hydrogen atom could attain an energy level and orbit below the "ground state" corresponding to a fractional quantum number because such an assertion did not conform to the known laws of physics and chemistry. The Director was immediately aware that any pending application embodying such a concept raise a substantial question of patentability of one or more claims which would require reopening prosecution.

The Director further became aware that another pending application that embraced the above-noted contradiction to the known laws of chemistry and physics, was application 09/009,294 and that application was scheduled to issue as a patent on February 29, 2000.

In response to a request for prompt assistance from the Director in ensuring that the patent would not issue, the Director, Special Programs Law Office (SPLO) requested that the above-identified application be withdrawn from issue under 37 CFR 1.313 by the Office of Petitions, which resulted in the Notice to applicant mailed February 17, 2000.

Due to the lateness of the request of the Director, the PTO could not prevent the previously scheduled publication of the specification in the February 29, 2000, *Official Gazette*. Nevertheless, as the Notice of February 17, 2000, indicated that this application had been withdrawn from issue, the patent did not issue on February 29, 2000. See Harley v. Lehman, 981 F. Supp. 9, 44 USPQ2d 1699 (D.D.C. 1997). As is usual in such instances, an erratum notice was published in the *Official Gazette* on March 14, 2000.

STATUTE, REGULATION, AND EXAMINING PROCEDURE

35 U.S.C. § 6(a) provides, in part, that:

> The Commissioner . . . may, subject to the approval of the Secretary of Commerce, establish regulations, not inconsistent with law, for the conduct of proceedings in the Patent and Trademark Office.

35 U.S.C. § 131 states:

> The Commissioner shall cause an examination to be made of the application and the alleged new invention; and if on such examination it appears that the applicant is entitled to a patent under the law, the Commissioner shall issue a patent therefor.

37 CFR 1.313 states that:

> (a) Applications may be withdrawn from issue for further action at the initiative of the Office or upon petition by the applicant. Any such petition by the applicant must include a showing of good and sufficient reasons why withdrawal of the application is necessary and, if the reason for the withdrawal is not the fault of the Office, must be accompanied by the fee set forth in § 1.17(i). If the application is withdrawn from issue, a new notice of allowance will be sent if the application is again allowed. Any amendment accompanying a petition to withdraw an application from issue must comply with the requirements of § 1.312.
> (b) When the issue fee has been paid, the application will not be withdrawn from issue for any reason except:
> (1) A mistake on the part of the Office;
> (2) A violation of § 1.56 or illegality in the application;
> (3) Unpatentability of one or more claims;
> (4) For interference; or
> (5) For abandonment to permit consideration of an information disclosure statement under § 1.97 in a continuing application.

MPEP 1201 states in pertinent part that:

> The Patent and Trademark Office in administering the Patent Laws makes many decisions of a discretionary nature which the applicant may feel deny him or her the patent protection to which he or she is entitled. The differences of opinion on such matters can be justly resolved only by prescribing and following judicial procedures. Where the differences of

opinion concern the denial of patent claims because of prior art or material deficiencies in the disclosure set forth in the application, the questions thereby raised are said to relate to the merits, and appeal procedure within the Patent and Trademark Office and to the courts has long been provided by statute.

The line of demarcation between appealable matters for the Board of Patent Appeals and Interferences (Board) and petitionable matters for the Commissioner of Patents and Trademarks should be carefully observed. The Board will not ordinarily hear a question which it believes should be decided by the Commissioner, and the Commissioner will not ordinarily entertain a petition where the question presented is an appealable matter.

OPINION

Petitioner asks that the Commissioner intervene and consider the instant petition. As to the merits of the petition, petitioner contends that the withdrawal from issue was a clear error as authorized by the Director of the Special Programs Law Office, and points to the communication addressed to the Director of Technology Center 1700 which accompanies the petition in support of his assertions. Petitioner's short letters to the Commissioner and Director Spar appear to rest on the theory that no *new* issue of patentibility arose. As noted below, this argument is without merit. The letter to Director Kepplinger, which accompanied the two former letters, merely requests a meeting with PTO personnel to discuss the application that was withdrawn.[2]

The decision of the Director to request withdrawal from issue to reopen prosecution of this application did not constitute either the rejection of a claim or a decision adverse to the ultimate patentibility of a claim. See In re Voss, 557 F.2d 812, 816, 194 USPQ 267, 270 (CCPA 1977). The PTO will issue in due course either a supplemental notice of allowance or an office action rejecting the claims. If the claims are rejected, Petitioner will then have a full opportunity to rebut the PTO's decision, including ultimately an appeal on the patentibility merits to the Board of Patent Appeals and Interferences.

---

[2] In the time period between submission of the petition and this decision, petitioner has been offered an opportunity to provide whatever information it chooses to submit to the PTO at an on-the-record Office Interview. However, petitioner has refused to participate in such a meeting although such a meeting was requested by petitioner.

While it is understandable that petitioner is concerned about the withdrawal from issue of the above-identified application, the record does not show that the SPLO has acted beyond the scope of its authority in promptly assisting with the request from the Director to secure the withdrawal of this application from issue, or, based on that request, authorizing the Notice of February 17, 2000, for the Technology Center's purpose of reopening prosecution. Rather, that assistance is specifically within the SPLO's purview.

Section 1.313(b) of 37 CFR specifically authorizes the PTO to withdraw an application from issue to reopen prosecution. See Harley v. Lehman, 981 F. Supp. 9, 11-12, 44 USPQ2d 1699, 1701-02 (D.D.C. 1997)(applications may be withdrawn from issue even after payment of the issue fee in situations wherein the Group Director seeks to reopen prosecution). The withdrawal Notice of which petitioner complains merely apprised petitioner of the fact of withdrawal, and further, served the purpose of returning jurisdiction of the application to the Technology Center. See MPEP 1302.

In reaching her decision, the Director read the specification of the `935 patent and noted, *inter alia*, that the shrunken, lower energy hydrogen atoms or "hydrinos," are asserted in the `935 patent to react with other atoms, such as those of metals, to produce hydrides, which are the compounds claimed in the application at issue. The principles set forth in the `935 patent are not known to the Director to be generally recognized by the scientific community, but rather, are indicated in the `935 patent to be the discovery of one of the above-named inventors who asserted to have built further on quantum mechanics and derived a new atomic theory based on "first principles." The `935 patent further claims that its "novel theory . . . unifies Maxwell's Equations, Newton's Laws, and Einstein's General and Special Relativity."[3]

The concept that hydrinos can be created by hydrogen atoms relaxed to below their "ground state," was recognized by the Director not to conform with the known laws of chemistry and physics that are embraced by the scientific community. This lack of compliance with the known laws of chemistry and physics reasonably caused the Director to request withdrawal from issue of the instant application due to the Director's determination that one or more claims lacked patentability.

[3] In its petition, petitioner refers to its invention as "revolutionary technology."

Furthermore, an inspection of Application No. 09/009,294 reveals that this invention is asserted to matters containing fractional quantum numbers. Such fractional quantum numbers do not conform to the known laws of physics and chemistry. For instance (1) page 5, lines 10-20, (2) page 11, lines 14-30, (3) page 68, lines 21-35, and (4) claim 17, all pertain to fractional quantum numbers which are not known to conform to the known laws of physics and chemistry.

The application did not issue as a patent on February 17, 2000, and thus, it did not enjoy the statutory presumption of validity, including operability, that is reserved only for an issued patent, when the Director requested withdrawal from issue. See 35 U.S.C. § 282. As such, the Director was not prohibited from determining anew that the technology embraced by the instant application lacked patentability of one or more claims.

That is, in light of (1) the application pertains to the field of chemistry (see title: "Hydride Compounds") which is often unpredictable, (2) the statement noted above by the Director which pertains to how these compounds are produced by a chemical reaction involving a hydrogen atom in a state that is not recognized by the scientific community which (3) the Director discerned was, on its face, contrary to generally accepted scientific principles, the reasonableness of the Director's decision to request withdrawal from issue to reopen prosecution is apparent. See In re Marzocchi, 439 F.2d 220, 223, 169 USPQ 367, 369-370 (CCPA 1971):

> In the field of chemistry generally, there may be times when the well-known unpredictability of chemical reactions will alone be enough to create a reasonable doubt as to the accuracy of a particular broad statement put forward as enabling support for a claim. This will especially be the case where the statement is, on its face, contrary to generally accepted scientific principles.

See also In re Chilowsky, 229 F.2d 457, 462, 108 USPQ 321, 325 (CCPA 1956):

> Thus, in the usual case where the mode of operation alleged can be readily understood and conforms to the known laws of physics and chemistry, operativeness is not questioned, and no further evidence is required. On the other hand, if the alleged operation seems clearly to conflict with a recognized scientific principle as, for example, where an applicant purports to have discovered a machine producing perpetual motion, the presumption of inoperativeness is so strong that very clear evidence is required to overcome it.

Further, while petitioner complains that the Notice of February 17, 2000, does not set forth any "new" issues of mistake, violation of 37 CFR 1.56, or unpatentabilty of one or more claims, in support of the withdrawal, 37 CFR 1.313 does not require the issue(s) be "new" for the Director's request for withdrawal from issue to be proper. Petitioner assumes that once a single PTO employee agrees with an applicant, even erroneously, no further review within the PTO is warranted or legally possible. Such a belief is without merit. For example, an examiner is not precluded from reopening prosecution to reinstate a rejection that had been made earlier in prosecution and withdrawn. See In re Freeman, 166 F.2d 178, 180, 76 USPQ 585, 586 (CCPA 1948).[4] See also 37 CFR 1.196(b) (Board of Patent Appeals and Interferences may enter grounds of rejection not contained in the examiner's final rejection when applicant appeals final rejection).

While petitioner in the accompanying letter points to favorable testimonials from scientists and entrepreneurs regarding the "revolutionary technology" that the instant application is asserted to embody, this does not establish that either the Director, Technology Center 1700, or the Director, Special Programs Law Office, committed reversible error, nor that the Notice should be withdrawn. In contrast, mainstream newspapers have reported this same "revolutionary technology" is accompanied by controversy in the scientific community. See Baard et al., *Scientists and entrepreneurs have lots of ideas about new sources of energy; some may even be practical*, Wall St. J., Sept. 13, 1999, at R16; Park, *Perpetual motion: still going around*, Washington Post, Jan. 12, 2000, at H3.

The PTO has an obligation to issue patents that meet the statutory requirements for patentibility. 35 U.S.C. § 131. See also In re Schmidt, 377 F.2d 639, 641, 153 USPQ 640, 642 (CCPA 1967); Markman v. Westview Instruments, Inc., 52 F.3d 967, 985

---

[4] In Freeman, the reopening of prosecution set forth, *inter alia*, a ground of rejection (double patenting) that had been made earlier in prosecution, but had not been repeated in the final rejection, and, as such, was not an issue considered in the first appeal. After this rejection was affirmed by the Board of Appeals in the second appeal, counsel for Freeman argued unsuccessfully to the court that the circumstances suggested that this ground of rejection had not initially been repeated due to its "doubtful propriety." The CCPA noted that the rejection was nevertheless properly before it for consideration on the merits, and likewise affirmed. Id.

n.14, 34 USPQ2d 1321, 1334 n.14 (Fed. Cir. 1995), aff'd, 116 S. Ct. 1384, 38 USPQ2d 1461 (1996). It would be contrary to sound public policy for the PTO to issue a possibly invalid patent. See Harley, 44 USPQ2d at 1701. When, as here, a "revolutionary technology" has been reported in the public record as being viewed with skepticism by two physicists of repute (including the 1997 Nobel co-laureate in physics, see Baard et al.) and further, another professor of physics (see Park) publicly asserts that such "revolutionary technology" does not conform with the known laws of physics and chemistry, it is reasonable for the PTO to withhold issuance to ensure that all the statutory requirements for a patent have been herein met.

While petitioner points to U.S. Patent No. 6,024,935 recently issued to Mills, the law is well settled that the issuance of that patent cannot operate to discharge the PTO's obligation with respect to the patentibility *vel non* of the instant application. See In re Margaroli, 318 F.2d 348, 138 USPQ 158 (CCPA 1963); In re Wright, 256 F.2d 583, 118 USPQ 287 (CCPA 1958); In re Launder, 212 F.2d 603, 101 USPQ 391 (1954). Rather, such issuance is immaterial to, and does not undermine, the reasonableness of the request of the Director to seek withdrawal from issue to permit reopening of prosecution, see In re Giolito, 530 F.2d 397, 188 USPQ 645 (CCPA 1976), or the reasonableness of the action of the SPLO in implementing that request.

This conclusion of reasonableness on the part of the PTO *vis-a-vis* patentability is reinforced by the controversy surrounding this allegedly "revolutionary technology." As the PTO examines applications which embrace almost every field of endeavor, it is reasonable for the PTO to take appropriate steps to satisfy itself in the first instance, especially when a controversial "revolutionary technology" is involved, that the statutory requirements pertaining to the issuance of patents have been met. See generally Newman v. Quigg, 877 F.2d 1575, 11 USPQ2d 1340 (Fed. Cir. 1989); Ex parte Dash, 27 USPQ2d 1481 (BPAI 1992).

DECISION

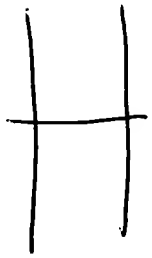
A review of the record indicates that the Director, Special Programs Law Office, and the Director, Technology Center 1700, did not act improperly in withdrawing the application from issue. For the foregoing reasons, the withdrawal of the application from issuance is appropriate.

As such, the Notice of February 17, 2000, will not be rescinded. The above-identified application remains withdrawn from issue. An Office Action addressing the merits of the application or a supplemental Notice of Allowance will issue in due course.

This decision, as with all petitionable procedural matters, does not relieve or suspend applicant's obligation to continue prosecuting the patent application. 37 CFR 1.181(f) ("The mere filing of a petition will not stay the period of reply to an Examiner's action which may be running against an application, nor does it act as a stay of other proceedings."). In this application, no time limit is currently pending against applicant.

Stephen G. Kunin
Deputy Assistant Commissioner for
Patent Policy and Projects

Jeffrey S. Melcher



From: "Peter Zimmerman" <peterz@erols.com>
To: <hydrino@yahoogroups.com>
Sent: Thursday, September 25, 2003 4:51 PM
Subject: Re: HSG: Zimmerman's Insincere Questions

No, Steve, I haven't met the man nor been to the lab.

But I've read his papers, been threatened by his legal squad, and read his old commentaries to this list and his off-list comments to me. In addition I've corresponded with some of his old professors and investors who know him well. And, yes, I've had significant conversations, mostly by e-mail, with the editors of the better-grade journals in which his articles have appeared.

I have merely expressed a personal opinion about the personality of RLMMD. And a professional opinion as to the correctness of his work. I'm entitled to do both.

--pz

smenton wrote:

>Peter Zimmerman wrote:
>
>
>
>>...I don't think
>>Mills is right, and I don't think he's either a nice person or a
>>
>>
>good
>
>
>>scientific colleague...
>>
>>
>
>So we can fully understand upon which these conclusions are based,
>have you ever met Mills? talked to him in person without lawyers
>present? Been to his lab? seen any of his experiments first hand?
>talked directly with any of the BLP employees who have been running
>the experiments for Mills? Talked directly with any of the outside
>consultants or other scientists who have actually attempted to
>replicate the reported experimental results? Talked with any of the
>editors or peer reviewers for any of the numerous journals that have
>published his work? Just curious.
>
>Steve Menton
>
>

>
>Hydrino Study Group (HSG):
>A serious look at the novel theory of Dr. Randell Mills.
> Web Site http://www.hydrino.org
> Post message: hydrino@yahoogroups.com
> Subscribe: hydrino-subscribe@yahoogroups.com
> Unsubscribe: hydrino-unsubscribe@yahoogroups.com
> List owner: hydrino-owner@yahoogroups.com
> Complaints: hydrino-unsubscribe@yahoogroups.com
>
>Your use of Yahoo! Groups is subject to http://docs.yahoo.com/info/terms/
>
>
>
>
>

[Non-text portions of this message have been removed]

REGARDING PZ's DEPARTING POST

Classical physics is remarkably successful at predicting the reality which we all experience and is indispensable as an engineering tool. In contrast, QM has mathematics which may be adjusted to give numbers which may agree with measurements, but it is at the expense of abandoning reality. My motivation for pursuing CQM was to attempt to apply first principles congruent with reality over all scales starting with the application of Maxwell's equations to the observation that the hydrogen atom is stable to radiation in vacuum or isolation. The results have been remarkable in terms of the diversity and accuracy of problems which can be solved and understood intuitively such as the prediction of the mass of the top quark and the acceleration of the expansion of the universe before the observations were made. Practical applications were sought. CQM makes predictions about novel reactions of atomic hydrogen. These prediction are being confirmed experimentally in a broad range of internally consistent and reinforcing tests. The novel hydrogen chemistry of BLP is no longer a theoretical argument but an experimental reality. The technological ramifications are extraordinary and vital.

PZ and his colleagues have tremendous vested interests in preserving QM. He has stated that he will stab a knife in the heart of CQM, but it appears that his blade has dulled or he has run out of diatribes about how I should believe the nonsensical and fantastical trappings of QM because he knew Schwinger or so and so. In any event, I feel I have a professional obligation to respond despite the fact that these are regurgitations of his old arguments which have already been dealt with.

REGARDING ANY ATTACKS ON PZ:

As stated in Melcher's post of 6/27/01

"It was not Dr. Zimmerman's criticisms of the hydrino theory that got him into potential trouble. Dr. Zimmerman represented in an abstract on the APS (American Physical Society) website that he was speaking on behalf of the U.S. State Department, and that the U.S. State Department and the U.S. Patent Office had fought back with success against BlackLight Power."

PZ's abstract is of public record in the documents that BlackLight

filed in its law suit against the Patent Office to right the Patent Office's withdrawing BlackLight's chemical patents from issuance.

REGARDING THE PZ CHALLENGE AND THE NONRADIATION CONDITION:

This challenge is nonsensical and clearly demonstrates the fundamental lack of PZ's understanding of Maxwell's equations and the application of first principles to quantum problems. This issue was dealt with in my prior posts such as:

Mills wrote:

>> A probability wave in a 1D box (electron only moves along one axis with
>> barriers at the ends) is not a physical problem. No real world data exists
>>

DMc74965@aol.com wrote:

>
>No real world data is required for this test case. All the test case has to
>show is that states below the alleged ground state exist.You claim "first
>principles" and "closed form equations". Such a simpler test case should
>demonstrate the application of these principles--and if they exist they must
>be able to be applied to the situation and derive the fractional energy
>states. That is what the 1d square well does for the schrodinger
>equation--it
>demonstrates the procedure and how it is applied, and shows how bound states
>require quantized energy levels. The quantized energy levels arise from the
>BOUNDARY CONDITIONS applied to the solution of the schrodinger equation. So
>tell us how to apply YOUR boundary conditions and what equation to use.

>
>Once you master the square well then the same procedure can be applied to
>the hydrogen atom. Just tell me the equations to use and I will do it >myself.
>If I can solve it and obtain the results you claim, fractional energy states
>below the ground state, I will have PhD mathematicians I know examine it for
>correctness and I will submit it myself to a recognized peer review journal
>for publication.

Mills also wrote:
>> A probability wave in a 1D box (electron only moves along one axis with
>> barriers at the ends) is not a physical problem. No real world data exists
>> to test any theoretical model based on this abstraction. The electron can
>> not be one dimensional and is not a probability wave in any of 1, 2, 3, 4,
>>

DMc74965@aol.com also wrote:

>That's a nice dodge. If there is really a hydrino theory, there must be a
>method of solution that can be applied to the situation described. If CQM is
>a "GUT", then it should be able to get the results of standard quantum
>mechanics, in addition to its own results. What equation do I apply? Tell me
>and I will do it myself. I would also point out that the 1d box problem is
>easily extended to 2 and 3 dimensions. So if 1d is the objection, then solve
>it for a 3 d box with infinite potentials on all sides. But we all know any
>equation, such as the schrodinger equation, or the wave equation,

can be
>taken down to 1 dimension. The wave equation can be solved for 1 space
>dimension and one time dimension. The response we get from Mills is exactly
>what I expected-alot of descriptive arguments but no mathematics. I suspect
>that Dr. Mills has no equation he can apply to demonstrate the existence of
>the quantized states of quantum mechanics *and* his fractional energy states.

If you insist in working in a fantasy world of purely mathematical abstractions, you should consider what is waving as an electromagnetic field corresponding to an abstraction of a photon--not a real photon, and the walls of the barrier as source current, just an abstraction and not really source current corresponding to an electron. (Footnote 1). Then a first box would represent the ground state it would only contain a single field line ending on a one dimensional charge at each barrier. Then consider a series of larger boxes that are integers of the size of the first and another series 1/integer smaller than the first. These boxes would contain 1D photons-only an abstraction and not real. The nonreal photon standing waves of each of these photons would be resonant in the 1D resonator cavities. The box of course gets bigger in an abstraction of an excited state and in the limit is infinitely big, and the box gets smaller in an abstraction of a fractional state to the limit of the fine structure times the size of the first box.

No Ph.D. in mathematics is needed. I guess you realize that mathematics as applied in these types of problems is merely addition in varies guises. With mathematics, it is possible to represent an infinite number of models with limitless fantasy--probability waves, virtual particles, negative energy of the vacuum, polarization of the vacuum by

virtual particles, renormalization, effective nuclear charge, ionic terms in the perturbation series, fermion propagators, virtual photon annihilation, virtual photon emission and reabsorption, virtual electron positron annihilation, photon propagators, plethora of postulated super-symmetry virtual particles which make contributions such as smuon-neutralino and sneutrino-chargino loops, neutrino oscillation, worm holes, parallel universes, parallel mind universes, quantum telepathy, entanglement, spooky actions at a distance, dark energy, exotic particles comprising dark matter, the universe from nothing, big bang-inflation,-deceleration-reacceleration of the universe, and so on and so on.

The challenging aspect is understanding the physics principles of the real world. The quantum mechanical example you give only means that a trigonometric function is periodic and you may conjecture that a barrier exists at two nodes of the function which is continuous from -infinity to +infinity. Then of course in the real world you can Not equate what is waving to an electron since acceleration is implicit in the waving, and Maxwell's equations demands that any accelerating point charge radiate. This consequence of the model actually disproves quantum mechanics since it unequivocally demonstrates that the Schrodinger solution for the electron violates Maxwell's equations.

Going back to the real world. A point charge undergoing periodic motion accelerates and as a consequence radiates according to the Larmor formula. Although an accelerated point particle radiates, an extended distribution modeled as a superposition of accelerating charges does not have to radiate (See ref. 1-5). It is possible to have an infinite number of charges or an ensemble of charge oscillating in such as way as to cause destructive interference or nodes in all directions. In order to obtain the condition, if it exists, that the electron current

distribution must satisfy such that the electron does not radiate, the electromagnetic far field is determined from the current distribution. Time dependent components of that field must vanish. See APPENDIX I Nonradiation Based on the Electromagnetic Fields and the Poynting POWER VECTOR section which applies this physics to a real world model of an electron and also see THE BOUNDARY CONDITION OF NONRADIATION AND THE RADIAL FUNCTION - THE CONCEPT OF THE "ORBITSPHERE" section [6] which applies the boundary condition of Haus [1] (Footnote 2) to a real world model of an electron.

Footnote 1. It is not even correct to view this abstraction as the projection of the 3D plus time world into 1D.

Footnote 2. For non-radiative states, the current-density function must not possess spacetime Fourier components that are synchronous with waves traveling at the speed of light.

1. Haus, H. A., "On the radiation from point charges", American Journal of Physics, 54, (1986), pp. 1126-1129.
2. Abbott, T. A., Griffiths, D. J., Am. J. Phys., Vol. 153, No. 12, (1985), pp. 1203-1211.
3. J. Daboul and J. H. D. Jensen, Z. Physik, Vol. 265, (1973), pp. 455-478.
4. P. Pearle, "Classical electron Models", Electromagnetism: Paths to Research, edited by D. Teplitz, Plenum, New York, Chp. 7 Pt 6, Radiationless Motion" (1982), pp. 237-240.
5. G. Goedecke, Phys. Rev., Vol. 135B, (1964), pp. 281-288.
6. R. Mills, The Grand Unified Theory of Classical Quantum Mechanics, January 2000 Edition, BlackLight Power, Inc., Cranbury, New Jersey, Distributed by Amazon.com. Latest edition posted at www.blacklightpower.com.

PZ continues to misunderstand and misrepresent the nonradiative condition.

1.) from my post of 7/31/01:

>when the experimenters say they did
>no such thing. Or that the Haus condition applies to bound
>orbiting electrons.

I explicitly give Haus's condition from his paper and show how his work
can be applied to a bound extended particle rather than a point particle.

On p 2. of R. Mills, The Grand Unified Theory of Classical Quantum Mechanics, July 2001 Edition, BlackLight Power, Inc., Cranbury, New Jersey, posted at www.blacklightpower.com appears

" Proof that the condition for nonradiation by a moving point charge is
that its spacetime Fourier transform does not possess components that are
synchronous with waves traveling at the speed of light is given by Haus
[1]. The Haus derivation applies to a moving charge-density function as
well because charge obeys superposition. The Haus derivation is summarized below."

On page 36 of R. Mills, The Grand Unified Theory of Classical Quantum
Mechanics, July 2001 Edition, BlackLight Power, Inc., Cranbury, New Jersey, posted at www.blacklightpower.com appears

"The Boundary Condition
The condition for radiation by a moving charge is derived from Maxwell's
equations. To radiate, the spacetime Fourier transform of the current-density function must possess components synchronous with waves
traveling at the speed of light [1]. Alternatively,

For non-radiative states, the current-density function must not possess
spacetime Fourier components that are synchronous with waves traveling at
the speed of light.

Derivation of the Condition for Nonradiation

The condition for radiation by a moving point charge given by Haus [1]
is that its spacetime Fourier transform does possess components that are
synchronous with waves traveling at the speed. Conversely, it is proposed that the condition for nonradiation by an ensemble of moving
point charges that comprises a charge density function is that its spacetime Fourier transform does NOT possess components that are synchronous with waves traveling at the speed of light. The Haus derivation applies to a moving charge-density function as well because
charge obeys superposition. The Haus derivation is summarized below."

Please try to be professional and refrain from misrepresentations.

Randy Mills

2.) The CQM solution of the n=1 state is ELECTROSTATIC AND MAGNETOSTATIC AND ANY COMPETENT PHYSICIST WOULD IMMEDIATELY RECOGNIZE THAT IT IS NONRADIATIVE.

3.) Other have published that although an accelerated point particle radiates, an extended distribution modeled as a superposition of accelerating charges does not have to radiate (See Abbott, T. A., Griffiths, D. J., Am. J. Phys., Vol. 153, No. 12,
(1985), pp. 1203-1211; J. Daboul and J. H. D. Jensen, Z. Physik, Vol. 265, (1973), pp. 455-478; P. Pearle, "Classical electron Models", Electromagnetism: Paths to Research, edited by D. Teplitz, Plenum, New York, Chp. 7 Pt 6, Radiationless Motion" (1982), pp. 237-240; and G. Goedecke, Phys. Rev., Vol. 135B, (1964), pp. 281-288).

4.) In addition to using the nonradiative constraint of Haus, Abbott, T. A., Griffiths, or G. Goedecke, I have also shown in Appendix I of Chp 1 that CQM solutions for p, d, f, etc. electrons do not radiate from consideration of the Poynting Power vector with vanishing of the far electromagnetic fields.

The results of CQM are remarkable. For example, the electron g factor is derived in close form with 11 figure match between calculated and observed values; whereas in QED it is purely fabricated and requires the existence of virtual particles. This renders it fatally flawed in terms of predicting a corresponding inescapable infinite cosmological constant and particle emission by blackholes as discussed below from my pervious post.

CQM results were shown previously:

I took a couple of days to answer some previous HSG questions. The plan is that the "Grand Unified Theory of Classical Quantum Mechanics" on our web page (www.blacklightpower.com) will be updated while I'm on vacation.

NEW MATERIAL:

ELECTRON g FACTOR (new pages 74-85)

The postulated quantum electrodynamics (QED) theory of g/2 is based on the determination of the terms of a postulated power series in alpha/2 where each postulated virtual particle is a source of postulated vacuum polarization that gives rise to a postulated term. The algorithm involves scores of postulated Feynman diagrams corresponding to thousands of matrices with thousands of integrations per matrix requiring decades to reach a consensus on the "appropriate" postulated algorithm to remove the intrinsic infinities. The remarkable agreement between Eqs. (1.204) and (1.205) demonstrates that g/2 may be derived in closed form from Maxwell's equations in a simple straightforward manner that yields a result with eleven figure agreement with experiment < the limit of the experimental capability of the measurement of the fundamental constants that determine alpha.

In Appendix II: Quantum Electrodynamics is Purely Mathematical and Has No Basis in Reality, the Maxwellian result is contrasted with

the QED algorithm of invoking virtual particles, zero point fluctuations of the vacuum, and negative energy states of the vacuum.

COMMENTS ON QED (new pages 101-105)

Appendix II: Quantum Electrodynamics is Purely Mathematical and Has No Basis in Reality covers:

fourth quantum number
g factor
Lamb shift
Casimir effect

NONRADIATION (new pages 95-100)

In addition to Haus' condition given by Eqs. (1.44-1.45), the orbitsphere states given by Eqs. (1.64-1.65) are shown to be nonradiative with the same condition as that of Eq. (1.45) applied to the vector potential as shown in Appendix I: Nonradiation Based on the Electromagnetic Fields and the Poynting Power Vector.

GROUND STATE (new pages 186-188)

Addresses the lowest accessible energy state of the electron of the hydrogen atom.

Next, I will be adding the recent data from NASA that confirms my cosmological theory that the universe accelerates from an initial state of zero velocity. (See Chp. 23)

We have recently had two additional papers accepted for publication including another invited paper. We will be posting more results as time permits. Some previous independent confirmation data is now posted in the Archive section of our web page. Our presentations at the National Hydrogen Association, 12th Annual U.S. Hydrogen Meeting and Exposition, Hydrogen: The Common Thread, The Washington Hilton and Towers, Washington DC, (March 6-8, 2001) are now posted. Also, click on Technical Papers from the Site Map for current experimental results.

Randy Mills

peter zimmerman wrote:

>I am sorry to hear that. If the paper were as iron-clad as Randy seems to
>think it is, it should have been submitted to a major physics or
>astrophysics, or applied physics journal. If this is the fat lady singing
>south of the south pole, then the evidence would have to be such as to
>convince even a skeptical referee at a major journal. To be sure, Mills
>might have to pay the editor a visit and do a little in-person sales job
>to ensure a good hearing, but the obligation is squarely on him to
>convince the community that he has made a major advance and replaced a
>theory which gives the Lamb shift to, what is it now, 11 significant
>figures or somewhere on that order.

I believe that you are mistaken and mean the electron g factor which is given to this precision in CODATA [P. J. Mohr and B. N. Taylor, "CODATA recommended values of the fundamental physical constants: 1998", Reviews of Modern Physics, Vol. 72, No. 2, April, (2000), pp. 355-495] and is widely touted as a major theoretical accomplishment of QED; whereas, the experimental values of the Lamb shift given in CODATA (pp. 374-375; p. 433) indicate that it is known experimentally to only about 5 figures.

The Lamb shift is given in closed form based on applying conservation of energy and linear momentum to the emitted photon and the electron and atom. (See pages 121-124 of R. Mills, "The Grand Unified Theory of Classical Quantum Mechanics", www.blacklightpower.com.) The method used by QED is based on virtual particles, negative energy

states,
and arbitrarily disregarding infinities that even Dirac opposed. See 1.)
APPENDIX II Quantum Electrodynamics is Purely Mathematical and Has No
Basis in Reality; 2.) R. Mills, The Nature of Free Electrons in Superfluid Helium--a Test of Quantum Mechanics and a Basis to Review its
Foundations and Make a Comparison to Classical Theory, Int. J. Hydrogen
Energy, in press, and 3.) R. Mills, "The Hydrogen Atom Revisited", Int. J. of Hydrogen Energy, Vol. 25, Issue 12, December, (2000), pp. 1171-1183.

The CQM g factor result was addressed in my post of 4/20:

I took a couple of days to answer some previous HSG questions. The plan
is that the "Grand Unified Theory of Classical Quantum Mechanics" on our
web page (www.blacklightpower.com) will be updated while I'm on vacation.

NEW MATERIAL:

ELECTRON g FACTOR (new pages 74-85)

The postulated quantum electrodynamics (QED) theory of g/2 is based on
the determination of the terms of a postulated power series in alpha/2
where each postulated virtual particle is a source of postulated vacuum
polarization that gives rise to a postulated term. The algorithm involves scores of postulated Feynman diagrams corresponding to thousands
of matrices with thousands of integrations per matrix requiring decades
to reach a consensus on the "appropriate" postulated algorithm to remove

the intrinsic infinities. The remarkable agreement between Eqs. (1.204)
and (1.205) demonstrates that g/2 may be derived in closed form from
Maxwell's equations in a simple straightforward manner that yields a result with eleven figure agreement with experiment < the limit of the
experimental capability of the measurement of the fundamental constants
that determine alpha.

In Appendix II: Quantum Electrodynamics is Purely Mathematical and Has No
Basis in Reality, the Maxwellian result is contrasted with the QED algorithm of invoking virtual particles, zero point fluctuations of the vacuum, and negative energy states of the vacuum.

COMMENTS ON QED (new pages 101-105)

Appendix II: Quantum Electrodynamics is Purely Mathematical and Has No
Basis in Reality covers:

fourth quantum number
g factor
Lamb shift
Casimir effect

NONRADIATION (new pages 95-100)

In addition to Haus' condition given by Eqs. (1.44-1.45), the orbitsphere
states given by Eqs. (1.64-1.65) are shown to be nonradiative with the
same condition as that of Eq. (1.45) applied to the vector potential as shown in Appendix I: Nonradiation Based on the Electromagnetic Fields and
the Poynting Power Vector.

GROUND STATE (new pages 186-188)

Addresses the lowest accessible energy state of the electron of the hydrogen atom.

Next, I will be adding the recent data from NASA that confirms my cosmological theory that the universe accelerates from an initial state of zero velocity. (See Chp. 23)

We have recently had two additional papers accepted for publication including another invited paper. We will be posting more results as time permits. Some previous independent confirmation data is now posted in the Archive section of our web page. Our presentations at the National Hydrogen Association, 12th Annual U.S. Hydrogen Meeting and Exposition, Hydrogen: The Common Thread, The Washington Hilton and Towers, Washington DC, (March 6-8, 2001) are now posted. Also, click on Technical Papers from the Site Map for current experimental results.

The CQM result for the muon g factor was addressed in my post of 5/14:

The muon, like the electron, is a lepton with hbar of angular momentum. The magnetic moment of the muon is given by Eq. (1.136) with the electron mass replaced by the muon mass. It is twice that from the gyromagnetic ratio as given by Eq. (2.36) of the Orbital and Spin Splitting section corresponding to the muon mass. As is the case with the electron, the magnetic moment of the muon is the sum of the component corresponding to the kinetic angular momentum, hbar/2, and the component corresponding to the vector potential angular momentum, hbar/2, (Eq. (1.132). The spin-flip transition can be considered as involving a magnetic moment of g times that of a Bohr magneton of the muon. The g factor is

equivalent
to that of the electron given by Eq. (1.196).

The muon anomalous magnetic moment has been measured in a new experiment
at Brookhaven National Laboratory (BNL) [29]. Polarized muons were
stored in a superferric ring, and the angular frequency difference omegasuba between the spin precession and orbital frequencies was determined by measuring the time distribution of high-energy decay positrons. The dependence of omegasuba on the magnetic and electric
fields is given by BMT equation which is the relativistic equation of motion for spin in uniform or slowly varying external fields [30]. The
dependence on the electric field is eliminated by storing muons with the
"magic" gamma =29.3, which corresponds to a muon momentum p=3.09 GeV/c.
Hence measurement of omegasuba and of B determines the anomalous magnetic
moment.

The "magic" gamma wherein the contribution to the change of the longitudinal polarization by the electric quadrapole focusing fields are
eliminated occurs when

gsubmu X beta/2-1/beta=0 (1.206)

where gsubmu is the muon g factor which is required to be different from
the electron g factor in the standard model due to the dependence of the
mass dependent interaction of each lepton with vacuum polarizations due
to virtual particles. For example, the muon is much heavier than the electron, and so high energy (short distance) effects due to strong and
weak interactions are more important here [26]. The BNL Muon (g-2)
Collaboration [29] used a "magic" gamma = 29.3 which satisfied Eq. (1.206) identically for gsubmu/2; however, their assumption that

this
condition eliminated the affect of the electrostatic field on omegasuba
is flawed as shown in Appendix III: Muon g Factor. Internal consistency
was achieved during the determination of gsubmu/2 using the BMT equation
with the flawed assumption that gsubmu/2 is not equal to gsube/2. The
parameter measured by Carey et al. [29] corresponding to gsubmu/2 was the
sum of a finite electric term as well as a magnetic term. The calculated
result based on the equivalence of the muon and electron g factors

$$gsubmu/2=1.001\ 165\ 923 \tag{1.207}$$

is in agreement with the result of Carey et al. [29]:

$$gsubmu/2=1.001\ 165\ 925\ (15) \tag{1.208}$$

Rather than indicating an expanded plethora of postulated super-symmetry
virtual particles which make contributions such as smuon-neutralino and
sneutrino-chargino loops as suggested by Brown et al. [31], the deviation
of the experimental value of gsubmu/2 from that of the standard model
prediction simply indicates that the muon g factor is identical to the electron g factor.

The derivations are posted at our webpage
(www.blacklightpower.com) See:
R. Mills, The Grand Unified Theory of Classical Quantum Mechanics, April,
2001 Edition, BlackLight Power, Inc., Cranbury, New Jersey, pp. 107-118.

The Casimir effect is addressed in (pages 102-106)

Appendix II: Quantum Electrodynamics is Purely Mathematical and Has No
Basis in Reality

Randy Mills

REGARDING QUANTIZATION

QM theory does not say why an atom radiates. Quantum states of QM refer to energy levels of probability waves. From these, emission and absorption of radiation is inferred. But QM doesn't explain why it is emitted or absorbed or why certain states are stable.

Since the Schrödinger equation offers no foundation for the stability of isolated atomic hydrogen, Feynman attempted to find a basis for the definition of the "ground state" in the Heisenberg uncertainty principle [137]. His attempt is shown to be fatally flawed in R. Mills, The Nature of Free Electrons in Superfluid Helium--a Test of Quantum Mechanics and a Basis to Review its Foundations and Make a Comparison to Classical Theory, Int. J. Hydrogen Energy, Vol. 26, No. 10, (2001), pp. 1059-1096.

The Schrödinger equation can only yield integer eigenvalue solutions by selection or definition from an infinite number of possibilities since the solution is over all space with no boundary (i.e. 0 to infinity). In contrast, wave equation solutions with integers are common for boundary constrained systems such as waveguides and resonators.

In the CQM case, quantization arises from first principles. The angular momentum of the photon given by m=1/8piRe[rx(ExB*)=hbar ($\mathbf{m} = \frac{1}{8\pi}\mathrm{Re}[\mathbf{r} \times (\mathbf{E} \times \mathbf{B}^*)] = \hbar$) is conserved [5] for the solutions for the resonant photons and excited state electron functions. It can be demonstrated that the resonance condition between these frequencies is to be satisfied in order to have a net change of the energy field [6]. In contrast to QM, the correspondence principle holds. That is the change in angular frequency of the electron is equal to the angular frequency of the resonant photon that excites the resonator cavity mode corresponding to the transition, and the energy is given by Planck's equation. The predicted energies, Lamb shift, hyperfine structure, resonant line shape, line width, selection rules, etc. are in agreement with observation.

REGARDING THE THREE DIMENSIONAL VERSUS TWO DIMENSIONAL WAVE EQUATION

I have shown in my previous posts that the three dimensional solutions have a number of problems in terms of the n=1 state radiating, disagreement with experiment on 18 experimental accounts with violation of first principles as shown in R. Mills, The Nature of Free Electrons in Superfluid Helium--a Test of Quantum Mechanics and a Basis to Review its Foundations and Make a Comparison to Classical Theory, Int. J. Hydrogen Energy, Vol. 26, No. 10, (2001), pp. 1059-1096. and R. Mills, "The Hydrogen Atom Revisited", Int. J. of Hydrogen Energy, Vol. 25, Issue 12, December, (2000), pp. 1171-1183. In fact, the Schrödinger equation can only yield integer eigenvalue solutions by selection or definition from an infinite number of possibilities since the solution is over all space with no boundary (i.e. 0 to infinity). In contrast, wave equation solutions with integers are common for boundary constrained systems such as waveguides and resonators.

PZ has it identically opposite. Physics determines the mathematics; mathematics does not determine physics. A two dimensional wave equation plus time and its separable solutions arises from invoking Maxwell's equations to a generalized three dimensional wave equation plus time. The wave equation and the corresponding solutions are well known [McQuarrie, D. A., *Quantum Chemistry*, University Science Books, Mill Valley, CA, (1983), p. 207]. In fact, the math is identical to the familiar rigid rotor problem of quantum mechanics. And, of course the force balance is solved. The force balance equation is clearly given at Eq. (1.165).

The outline of the solution is given below. The equations are not presented due to software limitations , but are given in R. Mills, The Nature of Free Electrons in Superfluid Helium--a Test of Quantum Mechanics and a Basis to Review its Foundations and Make a Comparison to Classical Theory, Int. J. Hydrogen Energy, Vol. 26, No. 10, (2001), pp. 1059-1096. Also see attachment.

A CLASSICAL APPROACH TO QUANTUM MECHANICS

Introduction

A theory of classical quantum mechanics (CQM) was derived from first principles by Mills [2] that successfully applies physical laws on all scales. The classical wave equation is solved with the constraint that a bound electron cannot radiate energy. The mathematical formulation for zero radiation based on Maxwell's equation's follows from a derivation by Haus [18]. The function that describes the motion of the electron must not possess spacetime Fourier components that are synchronous with waves traveling at the speed of light. CQM gives closed form solutions for the atom including the stability of the $n=1$ state and the instability of the excited states, the equation of the photon and electron in excited states, the equation of the free electron, and photon which predict the wave particle duality behavior of particles and light. The current and charge density functions of the electron may be directly physically interpreted. For example, spin angular momentum results from the motion of negatively charged mass moving systematically, and the equation for angular momentum, $\mathbf{r}\times\mathbf{p}$, can be applied directly to the wave function (a current density function) that describes the electron. The magnetic moment of a Bohr magneton, Stern Gerlach experiment, g factor, Lamb shift, resonant line width and shape, selection rules, correspondence principle, wave particle duality, excited states, reduced mass, rotational energies, and momenta, orbital and spin splitting, spin-orbital coupling, Knight shift, and spin-nuclear coupling are derived in closed form equations based on Maxwell's equations. The calculations agree with experimental observations.

Many great physicists rejected quantum mechanics. Feynman also attempted to use first principles including Maxwell's Equations to discover new physics to replace quantum mechanics [19]. Other great physicists of the 20th century searched. "Einstein [...] insisted [...] that a more detailed, wholly deterministic theory must underlie the vagaries of quantum mechanics" [20]. He felt that scientists were misinterpreting the data.

The results of Mills theory demonstrate that classical physical laws

describe reality on all scales. Unlike quantum mechanics which postulates that different laws apply on the atomic level, the premise of Mills theory is that a valid theory must comply with ALL of the following:

- theory must be internally consistent even between widely different phenomena
- Maxwell's equations
- conservation of matter/energy
- conservation of linear and angular momentum
- charge conservation
- first and second law of thermodynamics
- Newton's law in the low speed limit; special relativity otherwise
- general relativity (e.g. Schwarzschild metric)--no cosmological constant; and Newtonian gravitation in the weak field limit (which demands no cosmological constant)
- a vacuum is a vacuum
- constant maximum of the speed of light in a vacuum
- 4 dimensional spacetime
- the only allowed parameters are the measured fundamental constants

Quantum mechanics is based on engendering the electron with a wave nature as suggested by the Davisson-Germer experiment and fabricating a set of associated postulates and mathematical rules for wave operators. Quantum mechanics is in violation of Maxwell's equations as shown through application of Haus's condition to the Schrödinger wave functions [18]. Nonradiation based on Maxwell's equations is a necessary boundary constraint since nonradiation is observed experimentally. The short coming of QM regarding violation of Maxwell's equations and other first principles are further discussed in the Appendix.

Mills Approach to the Solution of the Electron:

Mills solves the electron by a different approach than that used to solve the Schrödinger wave equation. Rather than using a postulated wave equation with time eliminated in terms of the energy of the electron in a Coulomb field and solving the charge wave (Schrödinger interpretation) or the probability wave (Born interpretation), the solution

for the scalar (charge) and vector potential (current) functions of the electron are sought based on first principles. Mills first assumes that the functions that physically describe the mass and charge of the electron in space and time obeys the wave equation since it conserves energy and angular momentum. The solution is generalized to be three dimensional plus time. Rather than use the postulated Schrödinger boundary condition: $\Psi \to 0$ as $r \to \infty$, which leads to a purely mathematical model of the electron, the constraint is based on experimental observation that the moving charge must not radiate. Application of the Haus condition based on Maxwell's equations to a generalized three dimension plus time wave equation requires that the functions must be solutions of Eq. (45), a two dimensional wave equation plus time. This is consistent with first principle laws and ultimately matches experimentation. However, it is unconventional.

The two dimensional wave equation plus time is given by McQuarrie [21]. The electron is confined to two dimensions (θ and ϕ) plus time. Spherical harmonic functions and time harmonic functions are well known solutions of the angular and time components of the two dimensional wave equation plus time, respectively. The solutions appear in McQuarrie [22]. A constant current function is also a solution of the wave equation. A constant function corresponding to the electron spin function is added to each of the spherical harmonic functions to give the charge (mass) density functions of the electron as a function of time. The integral of a spherical harmonic function over the orbitsphere is zero. The integral of the constant function over the orbitsphere is the total charge (mass) of the electron. These functions comprise the well known s, p, d, f, etc. electrons or orbitals. In the case that such an electron state arises as an excited state by photon absorption, it is radiative due to a radial dipole term in its current density function since it possesses spacetime Fourier components synchronous with waves traveling at the speed of light.

The excited states are solved including the radii of the orbitspheres using Maxwell's equations with the traditional source current boundary constraints at the electron. Quantization arises from the equation of the photon and the electron--not from the solution of the electron alone. After all, each solution is for an excited state created by the absorption of

a photon. The solutions are analogous to those of excited resonator modes except that the cavity is dynamic. The field lines from the proton end on the current density function of the electron, and the electric field is zero for $r > r_n$. The trapped photons are a solution of the three dimensional wave equation plus time given by Maxwell's equations. The electrodynamic field of the photon's is a constant function plus a time and spherical harmonic function that is in phase with source currents at the electron which is given by a constant plus a time and spherical harmonic function. Only particular solutions are possible as resonant photons of the electron which is a dynamic resonator cavity. The results are in agreement with first principle physics and experimental observations of the hydrogen atom, excited states, free electron, and free space photon including the wave particle duality aspects.

Spin and Orbital Parameters Arise from First Principles:

An electron is a spinning, two-dimensional spherical surface, called an *electron orbitsphere*, that can exist in a bound state only at specific radii r_n from the nucleus. (See Figure 1 for a pictorial representation of an orbitsphere.) The result for the $n=1$ state of hydrogen is that the charge density function remains constant with each point on the surface moving at the same angular and linear velocity. The constant function solution of the two dimensional wave equation corresponds to the spin function which has a corresponding spin angular momentum that may be calculated from $\mathbf{r}\times\mathbf{p}$ applied directly to the current density function that describes the electron. The radius of the nonradiative ($n=1$) state is solved using the electromagnetic force equations of Maxwell relating the charge and mass density functions wherein the angular momentum of the electron is given by Planck's constant bar (Eq. (1.165) of [2]). The reduced mass arises naturally from an electrodynamic interaction between the electron and the proton rather than from a point mass revolving around a point nucleus in the case of Schrödinger wave equation solutions which presents an internal inconsistency since the wave functions are spherically symmetrical.

CQM gives closed form solutions for the resonant photons and excited state electron functions. Angular momentum of the photon given

by $\mathbf{m} = \frac{1}{8\pi}\mathrm{Re}[\mathbf{r} \times (\mathbf{E} \times \mathbf{B}^*)]$ is conserved. The change in angular velocity of the electron is equal to the angular frequency of the resonant photon. The energy is given by Planck's equation. The predicted energies, Lamb shift, hyperfine structure, resonant line shape, line width, selection rules, etc. are in agreement with observation.

The radii of excited states are solved using the electromagnetic force equations of Maxwell relating the field from the charge of the proton, the electric field the photon, and charge and mass density functions of the electron wherein the angular momentum of the electron is given by Planck's constant bar (Eq. (1.165) of [2]).

For excited states of the hydrogen atom, the constant function solution of the two dimensional wave equation corresponds to the spin function. Each spherical harmonic function modulates the constant spin function and corresponds to an orbital function of a specific excited state with a corresponding phased matched trapped photon and orbital angular momentum. Thus, the spherical harmonic function behaves as a charge density wave which travels time harmonically on the surface of the orbitsphere about a specific axis. (See Figure 2 for a pictorial representation.) An amplitude of the corresponding orbital energy may be calculated from Maxwell's equations. Since the constant function is modulated harmonically, the time average of the orbital energy is zero except in the presence of a magnetic field. Nondegeneracy of energy levels arises from spin, orbital, and spin-orbital coupling interactions with the applied field. The electrodynamics interaction with the magnetic field gives rise to the observed hyperfine splitting of the hydrogen spectrum.

Many inconsistencies arise in the case of the corresponding solutions of the Schrödinger wave equation. For example, where is the photon in excited states given by the Schrödinger equation? And a paradox arises for the change in angular momentum due to photon absorption. The Schrödinger equation solutions for the kinetic energy of rotation K_{rot} is given by Eq. (10) and the value of the electron angular momentum L for the state $Y_{lm}(\theta,\phi)$ given by Eq. (11) predict that the excited state rotational energy levels are nondegenerate as a function of the ℓ quantum number even in the absence of an applied magnetic field,

and the predicted energy is over six orders of magnitude of the observed nondegenerate energy in the presence of a magnetic field. In the absence of a magnetic field, no preferred direction exists. In this case, the ℓ quantum number is a function of the orientation of the atom with respect to an arbitrary coordinate system. Therefore, the nondegeneracy is nonsensical and violates conservation of angular momentum of the photon.

In quantum mechanics, the spin angular momentum of the electron is called the "intrinsic angular momentum" since no physical interpretation exists. The Schrödinger equation is not Lorentzian invariant in violation of special relativity. It failed to predict the results of the Stern-Gerlach experiment which indicated the need for an additional quantum number. Quantum electrodynamics was proposed by Dirac in 1926 to provide a generalization of quantum mechanics for high energies in conformity with the theory of special relativity and to provide a consistent treatment of the interaction of matter with radiation. It is fatally flawed. From Weisskopf [23], "Dirac's quantum electrodynamics gave a more consistent derivation of the results of the correspondence principle, but it also brought about a number of new and serious difficulties." Quantum electrodynamics; 1.) DOES NOT EXPLAIN NONRADIATION OF BOUND ELECTRONS; 2.) contains an internal inconsistency with special relativity regarding the classical electron radius - the electron mass corresponding to its electric energy is infinite (The Schrödinger equation fails to predict the classical electron radius); 3.) it admits solutions of negative rest mass and negative kinetic energy; 4.) the interaction of the electron with the predicted zero-point field fluctuations leads to infinite kinetic energy and infinite electron mass; 5.) Dirac used the unacceptable states of negative mass for the description of the vacuum; yet, infinities still arise. Dirac's equation which was postulated to explain spin relies on the unfounded notions of negative energy states of the vacuum, virtual particles, and gamma factors. All of these features are untenable or are inconsistent with observation. These problems regarding spin and orbital angular momentum and energies and the classical electron radius are nonexistence with CQM solutions [2].

Furthermore, Mills [24] shows that the Schrödinger equation may be transformed into a form consistent with first principles. In the case

that the potential energy of the Hamiltonian, H, is a constant times the wavenumber, the Schrödinger equation is the well known Bessel equation. Then with one of the solutions for the wavefunction Ψ (a current density function rather than a probability wave) is equivalent to an inverse Fourier transform. According to the duality and scale change properties of Fourier transforms, the energy equation of Mills theory and that of quantum mechanics are identical, the energy of a radial Dirac delta function of radius equal to an integer multiple of the radius of the hydrogen atom.

Mills Theory-*a classical quantum theory*

One-electron atoms include the hydrogen atom, He^+, Li^{2+}, Be^{3+}, and so on. The mass-energy and angular momentum of the electron are constant; this requires that the equation of motion of the electron be temporally and spatially harmonic. Thus, the classical wave equation applies and

$$\left[\nabla^2 - \frac{1}{v^2}\frac{\delta^2}{\delta t^2}\right]\rho(r,\theta,\phi,t) = 0 \tag{37}$$

where $\rho(r,\theta,\phi,t)$ is the charge density function of the electron in time and space. In general, the wave equation has an infinite number of solutions. To arrive at the solution which represents the electron, a suitable boundary condition must be imposed. It is well known from experiments that each single atomic electron of a given isotope radiates to the same stable state. Thus, Mills chose the physical boundary condition of nonradiation of the bound electron to be imposed on the solution of the wave equation for the charge density function of the electron. The condition for radiation by a moving point charge given by Haus [18] is that its spacetime Fourier transform does possess components that are synchronous with waves traveling at the speed of light. Conversely, it is proposed that the condition for nonradiation by an ensemble of moving point charges that comprises a charge density function is

> *For non-radiative states, the current-density function must NOT possess spacetime Fourier components that are synchronous with waves traveling at the speed of light.*

The Haus derivation applies to a moving charge-density function as well because charge obeys superposition. The Haus derivation is summarized below.

The Fourier components of the current produced by the moving charge are derived. The electric field is found from the vector equation in Fourier space (**k**, w-space). The inverse Fourier transform is carried over the magnitude of **k**. The resulting expression demonstrates that the radiation field is proportional to $\mathbf{J}_\perp(\frac{\omega}{c}\mathbf{n},\omega)$, where $\mathbf{J}_\perp(\mathbf{k},\omega)$ is the spacetime Fourier transform of the current perpendicular to **k** and $\mathbf{n}\equiv\frac{\mathbf{k}}{|k|}$. Specifically,

$$\mathbf{E}_\perp(\mathbf{r},\omega)\frac{d\omega}{2\pi}=\frac{c}{2\pi}\int\rho(\omega,\Omega)d\omega d\Omega\sqrt{\frac{\mu_0}{\varepsilon_0}}\mathbf{n}\,X\left(\mathbf{n}\,X\,\mathbf{J}_\perp\left(\frac{\omega}{c}\mathbf{n},\omega\right)e^{i\left(\frac{\omega}{c}\right)\mathbf{n}\cdot\mathbf{r}}\right) \tag{38}$$

The field $\mathbf{E}_\perp(\mathbf{r},\omega)\frac{d\omega}{2\pi}$ is proportional to $\mathbf{J}_\perp\left(\frac{\omega}{c}\mathbf{n},\omega\right)$, namely, the Fourier component for which $\mathbf{k}=\frac{\omega}{c}$. Factors of ω that multiply the Fourier component of the current are due to the density of modes per unit volume and unit solid angle. An unaccelerated charge does not radiate in free space, not because it experiences no acceleration, but because it has no Fourier component $\mathbf{J}_\perp\left(\frac{\omega}{c}\mathbf{n},\omega\right)$.

The time, radial, and angular solutions of the wave equation are separable. The motion is time harmonic with frequency ω_n. To be a harmonic solution of the wave equation in spherical coordinates, the angular functions must be spherical harmonic functions. A zero of the spacetime Fourier transform of the product function of two spherical harmonic angular functions, a time harmonic function, and an unknown radial function is sought. The solution for the radial function which satisfies the boundary condition is a delta function

$$f(r)=\frac{1}{r^2}\delta(r-r_n) \tag{39}$$

where $r_n=nr_1$ is an allowed radius. Thus, bound electrons are described by a charge-density (mass-density) function which is the product of a radial delta function ($f(r)=\frac{1}{r^2}\delta(r-r_n)$), two angular functions (spherical

harmonic functions), and a time harmonic function. Thus, an electron is a spinning, two-dimensional spherical surface, called an *electron orbitsphere*, that can exist in a bound state at only specified distances from the nucleus as shown in Figure 1. More explicitly, the orbitsphere comprises a two-dimensional spherical shell of moving charge.

The total function that describes the spinning motion of each electron orbitsphere is composed of two functions. One function, the spin function, is spatially uniform over the orbitsphere, spins with a quantized angular velocity, and gives rise to spin angular momentum. The other function, the modulation function, can be spatially uniform—in which case there is no orbital angular momentum and the magnetic moment of the electron orbitsphere is one Bohr magneton—or not spatially uniform—in which case there is orbital angular momentum. The modulation function also rotates with a quantized angular velocity.

The corresponding current pattern of the constant charge function of the orbitsphere corresponding to the spin function comprises an infinite series of correlated orthogonal great circle current loops. The current pattern is generated over the surface by two orthogonal sets of an infinite series of nested rotations of two orthogonal great circle current loops where the coordinate axes rotate with the two orthogonal great circles. Each infinitesimal rotation of the infinite series is about the new x-axis and new y-axis which results from the preceding such rotation. For each of the two sets of nested rotations, the angular sum of the rotations about each rotating x-axis and y-axis totals $\sqrt{2}\pi$ radians.

Consider the electron to be evenly distributed within two orthogonal great circle current loops. Then consider two infinitesimal point masses (charges), one and two, of two orthogonal great circle current loops. The Cartesian coordinate system wherein the first current loop lies in the yz-plane, and the second current loop lies in the xz-plane is designated the orbitsphere reference frame. Consider the two point masses, one and two, in the reference frame of the orbitsphere at time zero. Point one is at $x'=0$, $y'=0$, and $z'=r_n$ and point two is at $x'=r_n$, $y'=0$, and $z'=0$. Let point one move on a great circle toward the negative y'-axis, as shown in Figure 3, and let point two move on a great circle toward the positive z'-axis, as shown in Figure 3. The equations of motion, in the reference frame of the orbitsphere are given by

point one:

$$x_1' = 0 \qquad y_1' = -r_n \sin(\omega_n t) \qquad z_1' = r_n \cos(\omega_n t) \qquad (40)$$

point two:

$$x_2' = r_n \cos(\omega_n t) \qquad y_2' = 0 \qquad z_2' = r_n \sin(\omega_n t) \qquad (41)$$

The great circles are rotated by an infinitesimal angle $\Delta\alpha$ (a rotation around the x-axis) and then by $\Delta\alpha$ (a rotation around the new y-axis). The coordinates of each point on the rotated great circle is expressed in terms of the first (x,y,z) coordinates by the following transforms:

point one:

$$\begin{bmatrix} x_1 \\ y_1 \\ z_1 \end{bmatrix} = \begin{bmatrix} \cos(\Delta\alpha) & -\sin^2(\Delta\alpha) & -\sin(\Delta\alpha)\cos(\Delta\alpha) \\ 0 & \cos(\Delta\alpha) & -\sin(\Delta\alpha) \\ \sin(\Delta\alpha) & \cos(\Delta\alpha)\sin(\Delta\alpha) & \cos^2(\Delta\alpha) \end{bmatrix} \begin{bmatrix} x_1' \\ y_1' \\ z_1' \end{bmatrix} \qquad (42)$$

and $\Delta\alpha' = -\Delta\alpha$ replaces $\Delta\alpha$ for $\sum_{n=1}^{\frac{\sqrt{2}\pi}{\Delta\alpha}} \Delta\alpha = \sqrt{2}\pi$; $\sum_{n=1}^{\frac{\sqrt{2}\pi}{|\Delta\alpha'|}} |\Delta\alpha'| = \sqrt{2}\pi$

point two:

$$\begin{bmatrix} x_2 \\ y_2 \\ z_2 \end{bmatrix} = \begin{bmatrix} \cos(\Delta\alpha) & -\sin^2(\Delta\alpha) & -\sin(\Delta\alpha)\cos(\Delta\alpha) \\ 0 & \cos(\Delta\alpha) & -\sin(\Delta\alpha) \\ \sin(\Delta\alpha) & \cos(\Delta\alpha)\sin(\Delta\alpha) & \cos^2(\Delta\alpha) \end{bmatrix} \begin{bmatrix} x_2' \\ y_2' \\ z_2' \end{bmatrix} \qquad (43)$$

and $\Delta\alpha' = -\Delta\alpha$ replaces $\Delta\alpha$ for $\sum_{n=1}^{\frac{\sqrt{2}\pi}{\Delta\alpha}} \Delta\alpha = \sqrt{2}\pi$; $\sum_{n=1}^{\frac{\sqrt{2}\pi}{|\Delta\alpha'|}} |\Delta\alpha'| = \sqrt{2}\pi$

The total orbitsphere is given by reiterations of Eqs. (42) and (43). The output given by the non primed coordinates is the input of the next iteration corresponding to each successive nested rotation by the infinitesimal angle where the summation of the rotation about each of the x-axis and the y-axis is $\sum_{n=1}^{\frac{\sqrt{2}\pi}{\Delta\alpha}} \Delta\alpha = \sqrt{2}\pi$ and $\sum_{n=1}^{\frac{\sqrt{2}\pi}{|\Delta\alpha'|}} |\Delta\alpha'| = \sqrt{2}\pi$. The current pattern corresponding to point one and point two shown with 8.49 degree increments of the infinitesimal angular variable $\Delta\alpha(\Delta\alpha')$ of Eqs. (42) and (43) is shown from the perspective of looking along the z-axis in Figure 4. The complete orbitsphere current pattern corresponds to all such correlated points, point one and point two, of the orthogonal great circles shown in Figure 3 which are rotated according to Eqs. (42) and (43) where $\Delta\alpha(\Delta\alpha')$ approaches zero and the summation of the infinitesimal angular rotations of $\Delta\alpha(\Delta\alpha')$ about the successive x-axes and y-axes is

$\sqrt{2}\pi$. The current pattern gives rise to the phenomenon corresponding to the spin quantum number.

The fourth quantum number arises naturally in the Mills theory as derived in the Electron g Factor Section [2]. The Stern-Gerlach experiment implies a magnetic moment of one Bohr magneton and an associated angular momentum quantum number of 1/2. Historically, this quantum number is called the spin quantum number, s ($s=\frac{1}{2}; m_s=\pm\frac{1}{2}$). Conservation of angular momentum of the orbitsphere permits a discrete change of its "kinetic angular momentum" ($\mathbf{r}\times m\mathbf{v}$) by the field of $\frac{\hbar}{2}$, and concomitantly the "potential angular momentum" ($\mathbf{r}\times e\mathbf{A}$) must change by $-\frac{\hbar}{2}$. The flux change, ϕ, of the orbitsphere for $r<r_n$ is determined as follows:

$$\Delta\mathbf{L}=\frac{\hbar}{2}-\mathbf{r}\times e\mathbf{A} \tag{44}$$

$$=\left[\frac{\hbar}{2}-\frac{e2\pi rA}{2\pi}\right]\hat{z} \tag{45}$$

$$=\left[\frac{\hbar}{2}-\frac{e\phi}{2\pi}\right]\hat{z} \tag{46}$$

In order that the change of angular momentum, $\Delta\mathbf{L}$, equals zero, ϕ must be $\Phi_0=\frac{h}{2e}$, the magnetic flux quantum. Thus, to conserve angular momentum in the presence of an applied magnetic field, the orbitsphere magnetic moment can be parallel or antiparallel to an applied field as observed with the Stern-Gerlach experiment, and the flip between orientations (a rotation of $\frac{\pi}{2}$) is accompanied by the "capture" of the magnetic flux quantum by the orbitsphere. During the spin-flip transition, power must be conserved. Power flow is governed by the Poynting power theorem,

$$\nabla\bullet(\mathbf{E}\times\mathbf{H})=-\frac{\partial}{\partial t}\left[\frac{1}{2}\mu_o\mathbf{H}\bullet\mathbf{H}\right]-\frac{\partial}{\partial t}\left[\frac{1}{2}\varepsilon_o\mathbf{E}\bullet\mathbf{E}\right]-\mathbf{J}\bullet\mathbf{E} \tag{47}$$

Eq. (48) [2] gives the total energy of the flip transition which is the sum of the energy of reorientation of the magnetic moment (1st term), the magnetic energy (2nd term), the electric energy (3rd term), and the dissipated energy of a fluxon treading the orbitsphere (4th term), respectively.

$$\Delta E_{mag}^{spin} = 2\left(1+\frac{\alpha}{2\pi}+\frac{2}{3}\alpha^2\left(\frac{\alpha}{2\pi}\right)-\frac{4}{3}\left(\frac{\alpha}{2\pi}\right)^2\right)\mu_B B \tag{48}$$

$$\Delta E_{mag}^{spin} = g\mu_B B \tag{49}$$

The spin-flip transition can be considered as involving a magnetic moment of g times that of a Bohr magneton. The g factor is redesignated the fluxon g factor as opposed to the anomalous g factor. The calculated value of $\frac{g}{2}$ is 1.001 159 652 137. The experimental value of $\frac{g}{2}$ is 1.001 159 652 188(4).

The Mills theory solves the wave equation for the charge density function of the electron. The time, radial, and angular solutions of the wave equation are separable. Also, the radial function for the electron indicates that the electron is two-dimensional. Therefore, the angular mass-density function of the electron, $A(\theta,\phi,t)$, must be a solution of the wave equation in two dimensions (plus time),

$$\left[\nabla^2-\frac{1}{v^2}\frac{\delta^2}{\delta t^2}\right]A(\theta,\phi,t)=0 \tag{50}$$

where $\rho(r,\theta,\phi,t)=f(r)A(\theta,\phi,t)=\frac{1}{r^2}\delta(r-r_n)A(\theta,\phi,t)$ and $A(\theta,\phi,t)=Y(\theta,\phi)k(t)$

$$\left[\frac{1}{r^2\sin\theta}\frac{\delta}{\delta\theta}\left(\sin\theta\frac{\delta}{\delta\theta}\right)_{r,\phi}+\frac{1}{r^2\sin^2\theta}\left(\frac{\delta^2}{\delta\phi^2}\right)_{r,\theta}-\frac{1}{v^2}\frac{\delta^2}{\delta t^2}\right]A(\theta,\phi,t)=0 \tag{51}$$

where v is the linear velocity of the electron. The charge-density functions including the time-function factor are

$\ell = 0$

$$\rho(r,\theta,\phi,t)=\frac{e}{8\pi r^2}[\delta(r-r_n)]\left[Y_\ell^m(\theta,\phi)+Y_0^0(\theta,\phi)\right] \tag{52}$$

$\ell \neq 0$

$$\rho(r,\theta,\phi,t)=\frac{e}{4\pi r^2}[\delta(r-r_n)]\left[Y_0^0(\theta,\phi)+\mathrm{Re}\left\{Y_\ell^m(\theta,\phi)\left[1+e^{i\omega_n t}\right]\right\}\right] \tag{53}$$

where

$$\mathrm{Re}\left\{Y_\ell^m(\theta,\phi)\left[1+e^{i\omega_n t}\right]\right\}=\mathrm{Re}\left[Y_\ell^m(\theta,\phi)+Y_\ell^m(\theta,\phi)e^{i\omega_n t}\right]=P_\ell^m(\cos\theta)\cos m\phi+P_\ell^m(\cos\theta)\cos(m\phi+\omega_n t)$$

and $\omega_n = 0$ for $m = 0$.

The spin function of the electron (see Figure 1 for the charge

function and Figure 4 for the current function) corresponds to the nonradiative $n=1$, $\ell = 0$ state of atomic hydrogen which is well known as an s state or orbital. The constant spin function is modulated by a time and spherical harmonic function as given by Eq. (53) and shown in Figure 2. The modulation or traveling charge density wave corresponds to an orbital angular momentum in addition to a spin angular momentum. These states are typically referred to as p, d, f, etc. orbitals and correspond to an ℓ quantum number not equal to zero. Application of Haus's [18] condition (Eqs, (54-56)) also predicts nonradiation for a constant spin function modulated by a time and spherically harmonic orbital function. There is acceleration without radiation. (Also see Abbott and Griffiths and Goedecke [25-26]). However, in the case that such a state arises as an excited state by photon absorption, it is radiative due to a radial dipole term in its current density function since it possesses spacetime Fourier Transform components synchronous with waves traveling at the speed of light [2].

The Fourier transform of the electron charge density function is a solution of the four-dimensional wave equation in frequency space (**k**, w-space). Then the corresponding Fourier transform of the current density function $K(s,\Theta,\Phi,\omega)$ is given by multiplying by the constant angular frequency.

$$K(s,\Theta,\Phi,\omega) = 4\pi\omega_n \frac{\sin(2s_n r_n)}{2s_n r_n} \otimes 2\pi \sum_{\upsilon=1}^{\infty} \frac{(-1)^{\upsilon-1}(\pi\sin\Theta)^{2(\upsilon-1)}}{(\upsilon-1)!(\upsilon-1)!} \frac{\Gamma\left(\frac{1}{2}\right)\Gamma\left(\upsilon+\frac{1}{2}\right)}{(\pi\cos\Theta)^{2\upsilon+1}2^{\upsilon+1}} \frac{2\upsilon!}{(\upsilon-1)!} s^{-2\upsilon}$$

$$\otimes 2\pi \sum_{\upsilon=1}^{\infty} \frac{(-1)^{\upsilon-1}(\pi\sin\Phi)^{2(\upsilon-1)}}{(\upsilon-1)!(\upsilon-1)!} \frac{\Gamma\left(\frac{1}{2}\right)\Gamma\left(\upsilon+\frac{1}{2}\right)}{(\pi\cos\Phi)^{2\upsilon+1}2^{\upsilon+1}} \frac{2\upsilon!}{(\upsilon-1)!} s^{-2\upsilon} \frac{1}{4\pi}[\delta(\omega-\omega_n)+\delta(\omega+\omega_n)] \tag{54}$$

The motion on the orbitsphere is angular; however, a radial component exists due to special relativistic effects. Consider the radial wave vector of the sinc function. When the radial projection of the velocity is c

$$\mathbf{s}_n \bullet \mathbf{v}_n = \mathbf{s}_n \bullet \mathbf{c} = \omega_n \tag{55}$$

the relativistically corrected wavelength is

$$r_n = \lambda_n \tag{56}$$

(i.e. the lab frame motion in the angular direction goes to zero as the velocity approaches the speed of light). Substitution of Eq. (56) into the

sinc function results in the vanishing of the entire Fourier transform of the current-density function. Thus, spacetime harmonics of $\frac{\omega_n}{c} = k$ or $\frac{\omega_n}{c}\sqrt{\frac{\varepsilon}{\varepsilon_o}} = k$ for which the Fourier transform of the current-density function is nonzero do not exist. Radiation due to charge motion does not occur in any medium when this boundary condition is met.

The orbitsphere is a resonator cavity which traps photons of discrete frequencies. The radius of an orbitsphere increases with the absorption of electromagnetic energy. The solutions to Maxwell's equations for modes that can be excited in the orbitsphere resonator cavity give rise to four quantum numbers, and the energies of the modes are the experimentally known hydrogen spectrum.

The subscript n is used in Eq. (39) and Eq. (74), the quantization condition, appears in the Excited States of the One Electron Atom (Quantization) Section of Mills [2]. Quantization arises as "allowed" solutions of the wave equation corresponding to a resonance between the electron and a photon.

More explicitly, it is well known that resonator cavities can trap electromagnetic radiation of discrete resonant frequencies. The orbitsphere is a resonator cavity which traps photons of discrete frequencies. Thus, photon absorption occurs as an excitation of a resonator mode. The "trapped photon" is a "standing electromagnetic wave" which actually is a circulating wave that propagates along with each great circle current loop of the orbitsphere. The time-function factor, $k(t)$, for the "standing wave" is identical to the time-function factor of the orbitsphere in order to satisfy the boundary (phase) condition at the orbitsphere surface. Thus, the angular frequency of the "trapped photon" has to be identical to the angular frequency of the electron orbitsphere, ω_n. Furthermore, the phase condition requires that the angular functions of the "trapped photon" have to be identical to the spherical harmonic angular functions of the electron orbitsphere. Combining $k(t)$ with the ϕ-function factor of the spherical harmonic gives $e^{i(m\phi-\omega_n t)}$ for both the electron and the "trapped photon" function. The

photon is "glued" to the inner orbitsphere surface and the outer nuclear surface as photon source charge-density with a radial electric field.

From the application of the nonradiative boundary condition, the instability of excited states as well as the stability of the "ground" state arise naturally in the Mills theory as derived in Stability of Atoms and Hydrinos Section [2]. In addition to the above known states of hydrogen (Eq. (1), the theory predicts the existence of a previously unknown form of matter: hydrogen atoms and molecules having electrons of lower energy than the conventional "ground" state, called *hydrinos* and *dihydrinos*, respectively, where each energy level corresponds to a fractional quantum number.

The central field of the proton corresponds to integer one charge. Excited states comprise an electron with a trapped photon. In all energy states of hydrogen, the photon has an electric field which superposes with the field of the proton. In the $n=1$ state, the sum is one, and the sum is zero in the ionized state. In an excited state, the sum is a fraction of one (i.e. between zero and one). Derivations from first principles given by Mills demonstrate that each "allowed" fraction corresponding to an excited state is $\frac{1}{\text{integer}}$. The relationship between the electric field equation and the "trapped photon" source charge-density function is given by Maxwell's equation in two dimensions.

$$\mathbf{n} \bullet (\mathbf{E}_1 - \mathbf{E}_2) = \frac{\sigma}{\varepsilon_0} \tag{57}$$

where $\mathbf{n}$ is the radial normal unit vector, $\mathbf{E}_1 = 0$ ($\mathbf{E}_1$ is the electric field outside of the orbitsphere), $\mathbf{E}_2$ is given by the total electric field at $r_n = na_H$, and σ is the surface charge-density. The electric field of an excited state is fractional; therefore, the source charge function is fractional. It is well known that fractional charge is not "allowed". The reason is that fractional charge typically corresponds to a radiative current density function. The excited states of the hydrogen atom are examples. They are radiative; consequently, they are not stable. Thus, an excited electron decays to the first nonradiative state corresponding to an integer field, $n=1$ (i.e. a field of integer one times the central field of the proton).

Equally valid from first principles are electronic states where the

magnitude of the sum of the electric field of the photon and the proton central field are an integer greater than one times the central field of the proton. These states are nonradiative. A catalyst can effect a transition between these states via a nonradiative energy transfer. Substantial experimental evidence exists that supports the existence of this novel hydrogen chemistry and its applications [27-62] which was missed entirely due to the erroneous concept of the hydrogen atom "ground state" based on the Schrödinger equation. An analysis of the shortcomings of the Schrödinger equation are given in the Appendix and in a paper by Mills [7]. The success of the classical theory of Mills is demonstrated in a recent presentation and recent publications [59-62].

REGARDING THE FREE ELECTRON

Contrary to PZ's statements wherein he creates a straw man to knock down, the electron spin of the free electron is NOT required to be in the direction of propagation and are not required to be polarized. It is also remarkable that PZ claims that my solution for high energy scattering is flawed since I haven't presented it yet. I have presented the solution for elastic scattering of 500 eV electrons from helium atoms which is in remarkable agreement with published data; whereas it is acknowledged by the authors that QM utterly fails at small scattering angles. See Chp 8 of R. Mills, The Grand Unified Theory of Classical Quantum Mechanics, www.blacklightpower.com. Furthermore, the QM high energy scattering theories which PZ claims are so successful are not based on first principles, but are merely curve-fitting routines.

On page-158 appears:

Consider the case where a magnetic field is applied to the free electron. The energy of interaction of the magnetic moment of a Bohr magneton of the free electron with the applied magnetic field is minimized. The z'-axis (the former z-axis before the application of the magnetic field) of the free electron precesses parallel or antiparallel about the direction of the applied field, the z-axis called the spin axis now defined by the applied magnetic field. The center of mass of the electron propagates at the original constant velocity v_z in Eq. (3.2). The precessing free electron comprising a two dimensional disk rotates time harmonically about the x'-axis and by

the same angle, theta, at any time point, about the y'-axis (the primed axis refers to the coordinate system of the free electron where the two dimensional disk lies in each new x'y'(rho)-plane corresponding to each new set of axes established by rotations about the x' and y' axes) over the continuous angular range, $-\pi/2 <= \theta <= +\pi/2$ $(-\frac{\pi}{2} \le \theta \le \frac{\pi}{2})$.

Of course, quantum mechanics does not offer a solution to the free electron except for a contrived plane wave to explain electron scattering from atoms which utterly fails as small scattering angles as pointed out in my prior posts. Furthermore, the plane wave free electron of QM is not internally consistent:

• The Schrodinger equation predicts that each of the functions that corresponds to a highly excited state electron is not integrable and can not be normalized; thus, each is infinite.

• The Schrodinger equation predicts that the ionized electron is sinusoidal over all space and can not be normalized; thus, it is infinite.

The prediction of PZ based on the QM model of the free electron gives an infinite de Broglie electron wavelength and is inconsistent with the data of free electrons in superfluid helium as shown in my previous post:

Peter Zimmerman wrote:

> ++++ The electron radius cannot possibly depend upon the electron's
> velocity, since an unaccelerated e- doesn't know what its velocity is.
> This is simple special relativity. For the electron, the logical frame
to
> be in is its own rest frame. Thus, its radius cannot be a function of
its
> velocity, AND it cannot be two dimensional, nor even asymmetric in
its own
> rest frame because there is nothing in the frame to use to define
the
> vector. If it cannot be 2-d
> or asymmetric 3-d in its rest frame, the only logical shape for it is a
> sphere or a point. But since an extended electron would have
experimental

> consequences observable at very low energies (as well as very high
> energies), and since those consequences are never observed, then in its
> own rest frame the electron can only be a point.

Robin van Spaandonk wrote:

>> Good point! This is one of the points that I made in my earlier post:
>> http://groups.yahoo.com/group/hydrino/message/2576. The electron velocity
>> in Eq. 3.24 is given in *the inertial frame of the proton*. So, at least,
>> we can do away with an absolute reference frame. However, this is obviously
>> problematic when there is no proton in the system of question. I think we
>> need some explanation from Mills on this.

Peter Zimmerman wrote:

> ++++ The "inertial frame of the proton" makes no sense at all as a
> definition. It wholly fails in any experiment using storage rings,
> waveguides, etc.

The experimentally demonstrated de Broglie relationship is that the electron wavelength is inversely proportional to the electron's momentum relative to an inertial frame that is not the electron's frame since in this frame the electron is not moving. This case would imply an infinite de Broglie wavelength. CQM gives two Pi times the radius of the electron is the de Broglie wavelength [ref. 1 Electron in Free Space section]. The charge and current equations of the free electron match the experiments performed on the electron including positron-electron scattering [2-3], Stern Gerlach experiment, Davison Germer experiment, wave particle duality aspects, and scattering from atoms considering the nature of atomic electrons.

Your assertion is contradictory of experiments such as scattering experiments and the Davison Germer experiment. Furthermore, the universe is electrically neutral and contains no antimatter according to the particle production equation [(Eq. (23.172)) of ref. 1] of the contracting phase of the oscillatory universe. Particle production proceeds through a neutron pathway that gives the number of

electrons of the universe equal to the number of protons. The wavelength and the radius of the electron must depend on the velocity relative to the proton's inertial frame in order that relativistic invariance of charge holds and the universe is electrically neutral.

Quantum mechanics fails in these aspects. In fact, QM permits charged particles production including antimatter particles from a perfect vacuum (e.g. the experimentally not observed Hawking radiation). Furthermore, the point electron has infinite energy in its electric and magnetic fields, it is radiative in any bound state, it is not consistent with scattering experiments of free electrons and is inconsistent with scattering of electrons from atomic electrons. In the latter case, point atomic electrons can not give rise to neutral scattering and even while violating physics by requiring that the electron is everywhere at once or travels faster that the speed of light, QM utterly fails to match the results of elastic scattering from helium atoms.

The Schrodinger equation interpreted as a probability wave of a point particle can not explain that the hydrogen atom is neutral. For example, it can not explain neutral scattering of electrons or light from hydrogen. The point particles must align perfectly; otherwise Rutherford scattering would be observed. In this case, the Uncertainty Principle is violated. The Born interpretation can only be valid if the speed of the electron is equal to infinity. (The electron must be in all positions weighted by the probability density function during the time of the scattering event). The correct aperture function for the Born interpretation is a Dirac delta function having a Fourier transform of a constant divided by s^2 which is equivalent to the case of the point nucleus (Rutherford Equation). The Born interpretation must be rejected because the electron velocity can not exceed the speed of light without violating Special Relativity.

The elastic scattering of electrons from an atomic beam of helium atoms is given in the DERIVATION OF ELECTRON SCATTERING BY HELIUM section [1]. The equation of elastic scattering of 500 eV electrons from helium atoms is solved as the Fraunhofer pattern in the far field. The closed form equation of the free electron from the Electron in Free Space section is used with the closed form equation of the helium atom from the Two Electron Atoms section [1]. This is the case of Z in the closed form equation solved for all two electron atoms. The calculation is a Fourier optic type which reduces to a

spherical lens calculation. The math is well known. The resultant closed form equation has no adjustable parameters. The prediction identically and continuously matches the experimental scattering data [4]. In the case of the quantum mechanical calculation, the calculation is on a point-by point basis without regard to internal consistence or physical laws, is unstable--blows up to positive or negative infinity based on round-off error, contains adjustable parameters, and in the words of the authors, "at smaller scattering angles; however, the Born approximation calculation fails utterly, the experimental curve rising much more steeply that the theoretical" [5].

1. R. Mills, The Grand Unified Theory of Classical Quantum Mechanics, www.blacklightpower.com.
2. Gribbin, J., New Scientist, January, 25, (1997), p. 15.
3. Levine, I., et al., Physical Review Letters, Vol. 78., No. 3, (1997), pp. 424-427.
4. Bromberg, P. J., "Absolute differential cross sections of elastically scattered electrons. I. He, N2, and CO at 500 eV", The Journal of Chemical Physics, Vol. 50, No. 9, (1969), pp. 3906-3921; Geiger, J., "Elastische und unelastische streuung von elektronen an gasen", Zeitschrift fur Physik, Vol. 175, (1963), pp. 530-542; Peixoto,E. M., Bunge, C. F., Bonham, R. A., "Elastic and inelastic scattering by He and Ne atoms in their ground states", Physical Review, Vol. 181, (1969), pp. 322-328.
5. Bromberg, P. J., "Absolute differential cross sections of elastically scattered electrons. I. He, N2, and CO at 500 eV", The Journal of Chemical Physics, Vol. 50, No. 9, (1969), pp. 3906-3921

The point electron also fails to match experimental data described in 20 points in my papers given below and is further disproved by the well established data of the mobility of electrons in superfluid helium:

R. Mills, "The Hydrogen Atom Revisited", Int. J. of Hydrogen Energy, Vol. 25, Issue 12, December, (2000), pp. 1171-1183.

Several myths about quantum mechanics exist due to a loss of awareness of its details since its inception in the beginning of the last century or based on recent experimental evidence. It is taught in textbooks that atomic hydrogen cannot go below the ground state. Atomic hydrogen having an experimental ground state of 13.6 eV can only exist in a vacuum or in isolation, and atomic hydrogen

cannot go below this ground state in isolation. However, there is no known composition of matter containing hydrogen in the ground state of 13.6 eV. It is a myth that hydrogen has a theoretical ground state based on first principles. Historically there were many directions in which to proceed to solve a wave equation for hydrogen. The Schrodinger equation gives the observed spontaneously radiative states and the nonradiative energy level of atomic hydrogen. On this basis alone, it is justified despite its inconsistency with physical laws as well as with many experiments. A solution compatible with first principles and having first principles as the basis of quantization was never found. Scattering results required the solution to be interpreted as probability waves that give rise to the uncertainty principle which in turn forms the basis of the wave particle duality. The correspondence principal predicts that quantum predictions must approach classical predictions on a large scale. However, recent data has shown that the Heisenberg uncertainty principle as the basis of the wave particle duality and the correspondence principle taught in textbooks are experimentally incorrect. Recently, a reconsideration of the postulates of quantum mechanics, has given rise to a closed form solution of a Schrodinger-like wave equation based on first principles. Hydrogen at predicted lower energy levels has been identified in the extreme ultraviolet emission spectrum from interstellar medium. In addition, new compositions of matter containing hydrogen at predicted lower energy levels have recently been observed in the laboratory, which energy levels are achieved using the novel catalysts.

R. Mills, The Nature of Free Electrons in Superfluid Helium--a Test of Quantum Mechanics and a Basis to Review its Foundations and Make a Comparison to Classical Theory, Int. J. Hydrogen Energy, submitted.

The Schrodinger equation was originally postulated in 1926 as having a solution of the one electron atom. It gives the principal energy levels of the hydrogen atom as eigenvalues of eigenfunction solutions of the Laguerre differential equation. But, as the principal quantum number $n>>1$, the eigenfunctions become nonsensical. Despite its wide acceptance, on deeper inspection, the Schrodinger solution is plagued with many failings as well as difficulties in terms of a physical interpretation that have caused it to remain controversial since its inception. Only the one electron atom may be solved without approximations, but it fails to predict electron spin and leads to models with nonsensical consequences such as negative energy states of the vacuum, infinities, and negative kinetic energy.

In addition to many predictions which simply do not agree with observations, the Schrodinger equation predicts noncausality, nonlocality, spook actions at a distance or quantum telepathy, perpetual motion, and many internal inconsistencies where contradicting statements have to be taken true simultaneously. Recently, the behavior of free electrons in superfluid helium has again forced the issue of the meaning of the wavefunction. Electrons form bubbles in superfluid helium which reveal that the electron is real and that a physical interpretation of the wavefunction is necessary. Furthermore, when irradiated with light of energy of about a 0.5 to several electron volts [1], the electrons carry current at different rates as if they exist with different sizes. It has been proposed that the behavior of free electrons in superfluid helium can be explained in terms of the electron breaking into pieces at superfluid helium temperatures [1]. Yet, the electron has proven to be indivisible even under particle accelerator collisions at 90 GeV (LEPII). The nature of the wavefunction must now be addressed. It is time for the physical rather than the mathematical nature of the wavefunction to be determined. A theory of classical quantum mechanics (CQM) was derived from first principles by Mills [2] that successfully applies physical laws on all scales. Using the classical wave equation with the constraint of nonradiation based on Maxwell's equations, CQM gives closed form physical solutions for the electron in atoms, the free electron, and the free electron in superfluid helium. The prediction of fractional principal quantum energy states of the electron in liquid helium match the photoconductivity and mobility observations without requiring that the electron is divisible.

Randy Mills

High energy scattering experiments confirm the CQM picture of the free electron. This issue has also been dealt with previously:

Things that Go Bump in the Night

Peter Zimmerman wrote:

>I have received the KEK paper (Levine, et al., PRL 78, No.
>3, 20 Jan 1997, pp 424-427) which Mills has frequently used
>to say that scientists have now proven that the electron
>behaves like a distributed object. I have had time to go

>through the paper a couple of times, and I must say that I
>am wholly unable to fathom how Mills extracted that notion
>from the measurement of the electromagnetic coupling at
>large values of the 4-momentum transfer squared (Q**2).
>
>It is true that the EM coupling constant increases slightly
>above 1/137 as Q**2 increases (to around 1/128), but that is
>exactly as would be expected based on the standard theory of
>a point electron. I grant that Mills will reject this
>reading of the paper, because he doesn't believe in Feynman
>diagrams, virtual photons, virtual particles, vacuum
>polarization, etc. But it is perfectly in accord with
>theory and with other measurements of the electro-weak force
>increasing at large Q**2 and the strong force decreasing.
>
>If Mills rejects the plain language interpretation of the
>paper, that is his choice. However, since nothing of the
>kind was shown, it is incorrect of him to say that it
>demonstrates that "the charge of a free electron increases
>towards the particle's core and is symmetric in phi." He
>should not put words into the mouths of the KEK researchers.
>
>I will not make a copy of the paper available for posting to
>HSG's site because of the copyright issue. The paper may be
>downloaded from the APS only on payment of a fee, and I
>think that should extend to downloading from HSG.

>From Gribbin, J., New Scientist, January, 25, (1997), p. 15.

"An electron may be more than a simple blob of charge, contrary to conventional theory. Research by a team of Japanese and American physicists suggest that the electromagnetic charge in an electron increases towards the particle's central core.....The true value of the electromagnetic charge near the center was far greater than at the edge. The charge on the electron appears to be evenly distributed around its surface..."

Quantum mechanical interpretations of this and other data discussed infra. are:

1.) virtual particles surround the electron and shield the charge less effectively as the electron's center is approached,

2.) spooky action at a distance,
3.) a 9Be+ ion may be in two separate locations at once,
4.) supercurrent may go in both directions at once,
5.) perpetual motion is predicted.

Then there is reality:

1.) the electron charge density is greatest in center,
2.) photon momentum is conserved on a photon by photon basis rather than statistically as predicted by quantum mechanics,
3.) the fluorescence emission spectrum of a Penning trapped 9Be+ ion shows interference peaks due to coupling between oscillator modes and a Stern Gerlach transition,
4.) the energy difference of a superconducting loop observed by Friedman et al. matches the energy corresponding to the flux linkage of the magnetic flux quantum by the ensemble of superconducting electrons in their entirety with a reversal of the corresponding macroscopic current,
5.) perpetual motion is not permitted or observed.

These examples are given in the Wave-Particle Duality section of R. Mills, The Grand Unified Theory of Classical Quantum Mechanics, April 2001 Edition, BlackLight Power, Inc., Cranbury, New Jersey, www.blacklightpower.

and

R. Mills, The Nature of Free Electrons in Superfluid Helium--a Test of Quantum Mechanics and a Basis to Review its Foundations and Make a Comparison to Classical Theory, Int. J. Hydrogen Energy, in press.

The Heisenberg Uncertainty Principle Predicts Nonlocality, Noncausality, Spooky Actions at a Distance, and Perpetual Motion which can be Shown to be Experimentally Incorrect.

Flawed Interpretation of the Results of the Aspect Experiment--There Is No Spooky Action at a Distance

Bell [121] showed that in a Gedanken experiment of Bohm [122] (a variant of that of EPR) no local hidden-variable theory can reproduce all of the statistical predictions of quantum mechanics. Thus, a paradox arises from Einstein's conviction that quantum-mechanical predictions concerning spatially separated systems are incompatible

with his condition for locality unless hidden variables exist. Bell's theorem provides a decisive test of the family of local hidden-variable theories (LHVT). In a classic experiment involving measurement of coincident photons at spatially separated detectors, Aspect [123] showed that local hidden-variable theories are inconsistent with the experimental results. Although Aspect's results are touted as a triumph of the predictions of quantum mechanics, the correct coincidence rate of detection of photons emitted from a doubly excited state of calcium requires that the z component of the angular momentum is conserved on a photon pair basis. As a consequence, a paradox arises between the deterministic conservation of angular momentum and the Heisenberg uncertainty principle. The prediction derived from the quantum nature of the electromagnetic fields for a single photon is inconsistent with Aspect's results, and Bell's theorem also disproves quantum mechanics. Furthermore, the results of Aspect's experiment are predicted by Mills' theory wherein locality and causality hold. Mills derives the predicted coincidence rate based on first principles [124]. The predicted rate identically matches the observed rate.

The Aspect experiment is a test of locality and local hidden variable theories. The Aspect experiment is also a test of quantum mechanics and the HUP. In one design of the experiment, photons are incident to a beam splitter which causes each photon to be split into two that travel along opposite paths to separate detectors. The separate detectors measure the polarization of the arriving photons. By using synchronous detection, photons of a pair may be later compared. The data indicate a random pattern at each detector individually; however, when photons are matched up as pairs, an essentially perfect correlation exists. The quantum mechanical explanation is that before the photon was split its state of polarization was indeterminate. It possessed an infinite number of states in superposition. Then when one element of the pair was detected information traveled instantaneously (infinitely faster than the speed of light--otherwise known as a spooky action at a distance) to cause the other photon to have a matching polarization. In quantum mechanical terms, the states were entangled, and measurement of one photon caused the other photon's wavefunction to collapse into the matching state.

The correct explanation is that each photon entering the beam splitter originally had a determined state, and angular momentum was conserved on a photon by photon basis at the splitter. Thus,

each photon of a pair had a matching polarization before it hit the detector. Locality and cause and effect hold. There is no spooky action at a distance. This experiment actually disproves quantum mechanics. It also disproves local hidden variable theories. The data of the Aspect experiment matches a classical derivation, not a quantum mechanical one.

Everyday observation demonstrates that causality and locality always hold. Bell's theorem postulates that a statistical correlation of A(a) and B(b) is due to information carried by and localized within each photon, and that at some time in the past the photons constituting one pair were in contact and in communication regarding this information. This is the case in many everyday experiences such as transmission, processing, and reception of signals in microelectronics devices. Locality and causality always hold. They hold on the scale of the universe also. But, according to the Big Bang theory of quantum mechanics all photons were at one time in contact; thus, no locality or causality should be observed at all. This is nonsense. The results of the Aspect experiment support the EPR paradox that QM does not describe physical reality. There is a mistake in the derivation of the analysis of the data from Aspect's experiment [125-126].

Bell's theorem is just an inequality relationship between ARBITRARY probability density functions with certain assumptions about independence, expectation value equal to one, etc. wherein an additional probability distribution function is introduced which may represent local hidden variables or something else for that matter. And, the initial functions may correspond to quantum mechanical statistics or something else for that matter. Standard probability rules are accepted such as the probability of two independent events occurring simultaneously is the product of their independent probabilities. What is calculated and plugged into the formula for the functions and whether the substitutions are valid are the issues that determine what Bell's inequality tests when compared with data. Historically, Bell's inequality is a simple proof of statistical inequalities of expectation values of observables given that quantum statistics is correct and that the physical system possesses "hidden variables". However, if deterministic statistics are actually calculated and quantum statistics is equivalent to deterministic statistics (e.g. detection of a wave at an inefficient detector) but possesses further statistics based on the probability nature of the theory (statistical conservation of photon angular momentum), then Bell's inequality is

actually testing determinism versus quantum theory when compared to the data.

Rather than demonstrating that QM does not give us all of the information about the physical world, the data is consistent with the result that QM does not describe the physical world, and that deterministic physics does. A deterministic theory is not required to posses local hidden variables. Maxwell's equations is a deterministic theory. It does not have local hidden variables (LHV). There is no corresponding statistical distribution function. Bell's theorem is a simple proof of statistical inequalities of expectation values of observables given that "QUANTUM" statistics is correct and that the physical system possesses "hidden variables" corresponding to an additional statistical distribution function. What was actually derived to explain the results of the Aspect experiment [123] was a classical calculation of the detection of an extended particle, the polarized photon, at an inefficient detector wherein determinism holds with respect to conservation of angular momentum [125-126]. Thus, the statistics defined as "QUANTUM" was actually deterministic. (The derivation is given by Mills [124]). Furthermore, in actuality, quantum statistics must also possess other statistical distribution functions corresponding to the probability nature of the theory such as a statistical distribution for the z component of angular momentum which is conserved statistically as the number of photons goes to infinity. Thus, the real quantum mechanics statistics corresponds to a local hidden variable theory (LHVT) with respect to the definitions of the arbitrary probability distribution functions in Bell's inequality. Aspect recorded the expectation value of the coincidence rate at separated randomly oriented inefficient polarization analyzers for pairs of photons emitted from a doubly excited state calcium atom. The data showed a violation of Bell's inequality. This proves determinism and the real QM statistics fails the test. Furthermore, the observed coincidence count rate of Aspect [123] is equal to that predicted classically from the statistics of measurement at an inefficient detector only. The additional finite distribution function required in the case of quantum mechanics and QED results in incorrect predictions. There is no spooky action at a distance.

The Aspect experiment shows that momentum in conserved on a photon by photon basis, not statistically as predicted by the HUP. Similar experiments regarding tests of entanglement predicted by the HUP are shown to be consistent with first principle predictions

and reveal flaws in the interpretations based on the HUP. The HUP implies nonlocality, noncausality, and spooky actions at a distance which can be shown to be experimentally incorrect.

Flawed Interpretation of the Results on a Single 9Be+ Ion in a Trap in a Continuous Stern-Gerlach Experiment--An Ion Can Not Be at Two Places at the Same Time

There is a mistake in the analysis of the data from Monroe et al. [127]. Their interpretation that the same beryllium ion was observed to be at widely separated points at the same time is absolute nonsense. Their experimental results show that locality and causality hold [128].

A report in New York Times [129] entitled "Physicists Put Atom in 2 Places at Once" states, "a team of physicists has proved that an entire atom can simultaneously exist in two widely separated places". The article further states, "In the quantum "microscale" world, objects can tunnel magically through impenetrable barriers. A single object can exist in a multiplicity of forms and places. In principle, two quantum-mechanically "entangled" objects can respond instantly to each other's experiences, even when the two objects are at the opposite ends of the universe". Experimentally, interference patterns were observed by Monroe et al. [127] for a single 9Be+ ion in a trap in a continuous Stern-Gerlach experiment. Monroe's interpretation of the experimental observation was that the ion wave-function interfered with itself wherein the ion was at two separate places at the same time corresponding to a wave function state called a "Schrodinger cat" state [127, 129-130]. According to Monroe et al.,

"A "Schrodinger cat"-like state of matter was generated at the single atom level. A trapped 9Be+ ion was laser-cooled to the zero-point energy and then prepared in a superposition of spatially separated coherent oscillator states. This state was created by application of a sequence of laser pulses, which entangles internal (electronic) and external (motional) states of the ion. The "Schrodinger cat" superposition was verified by detection of the quantum mechanical interference between the localized wave packets. This mesoscopic system may provide insight into the fuzzy boundary between the classical and quantum worlds by allowing controlled studies of quantum measurement and quantum decoherence."

The "Schrodinger cat" state analysis relies on the postulate that the

Pauli Exclusion Principle applies to Rabi states wherein a rotation of the magnetic moment of the unpaired electron of an RF-trapped ion is represented by a linear combination of spin 1/2 and spin -1/2 states. Three steps of rotation of the spin magnetic moment by a time harmonic field provided by pairs of copropagating off-resonant laser beams which drove two-photon-stimulated Raman magnetic resonance transitions were each separated by displacement laser pulses which excited a resonant translational harmonic oscillator level of the trapped ion by coupling only with the +1/2 state. According to Monroe, "this selectivity of the displacement force provides quantum entanglement of the internal state with the external motional state. Although the motional state can be thought of as nearly classical, its entanglement with the internal atomic quantum levels precludes any type of semiclassical analysis". The interference was detected by exciting a fluorescent transition which only appreciatively coupled to the -1/2 state. Thus, the fluorescence reading was proportional to the probability P(-) the ion was in state -1/2. The "Schrodinger cat" superposition was supposedly verified by detection of the quantum mechanical interference between the localized wave packets.

However, the interference arises not from the existence of the ion at two places at once. The positively charged ion was excited to a time harmonic translational energy state, and the spin quantization axis was defined by an applied 0.3 mT magnetostatic field at an angle of Pi/4 with respect to the x-axis of the RF-trap. The frequency of the energy to "flip" the spin state was equivalent to the projection of that of the translational harmonic oscillator onto the spin axis

w/2Pi cos^2Pi/411.2 MHz)(0.5) MHzta E spin/h (132)

given by Eqs. (37.45-37.48) of Mills [128]. Thus, interference occurred between the Stern-Gerlach transition and the synchrotron radiation corresponding to the charged harmonic oscillator. Since the displacement beams affected only motion correlated with the +1/2state, a rotation of the magnetic moment such that delta not equal zero with application of the displacement beams gives rise to a phase shift of the interference pattern. The closed form calculation is given in Mills [128].

Flawed Interpretation of the Results of Experiments on a Small SQUID Coupled to a Biased Large Superconducting Current Loop--A Superconducting Current Can Not Flow in Opposite Directions at the

Same Time

There is a mistake in the analysis of the data from Friedman et al. [131]. Their interpretation that a superconducting current loop can exist as a superposition of contradictory states at the same time is absolute nonsense. It is shown by Mills [132] that their experimental results are consistent with locality and causality.

A recent report in The New York Times [133] entitled "Here, There and Everywhere: A Quantum State of Mind" states, "Physicists at Delft University of Technology have put a 5-micrometer-wide loop of superconducting wire into a "quantum superposition" of two contradictory possibilities: in one, the current flows clockwise; in the other, current flows counterclockwise." The article further states, "In the realm of atoms and smaller particles, objects exist not so much as objects as mists of possibilities being here there and everywhere at the same time-and then someone looks and the possibilities suddenly collapse into definite locations." The experiment was a simplified version of the concept of Schrodinger's cat. In 1935, Schrodinger [134] attempted to demonstrate the limitations of quantum mechanics using a thought experiment in which a cat is put in a quantum superposition of alive and dead states.

Instead of a cat, Friedman et al. [131] used a small square loop of superconducting wire linked to a SQUID (Superconducting Quantum Interference Device). A SQUID comprises a superconducting loop with a Josephson junction, a weak link that causes magnetic flux to be linked in integer units of the magnetic flux quantum. When the loop is placed in an external magnetic field, the loop spontaneously sets up an electrical current to cancel the field or generate an additional magnetic field, adjusting the magnetic field to a unit of the magnetic flux quantum, one of the allowed values. In the experiment of Friedman et al., the loop was placed in a magnetic field equal to one half of the first allowed value, a magnetic flux quantum. Thus, the loop could set up either a current to raise the field strength to the first allowed value, or with equal probability, a current of equal magnitude flowing in the opposite direction to cancel out the external field. A pulse of microwaves was applied at the frequency to cause a transition of the magnetic moment of the current loop as an entirety. The absorption of microwaves caused the magnetic state of the SQUID to change and the current to reverse its direction.

Experimentally, a measurement always gave one of the two possible

answers, clockwise or counterclockwise, never a zero cancellation. A difference in energy at which the flip transition occurred between the two possibilities was detected by a group led by J. Lukens and J. Friedman at the State University of New York (SUNY). A simple explanation was that the microwaves simply flipped the current direction which had an energy bias in one direction versus the opposite based on the corresponding presence or absence of a magnetic flux quantum within the SQUID. Rather, they interpreted the results as experimental evidence that a SQUID can be put into a superposition of two magnetic flux states: one corresponding to a few microamperes of current flowing clockwise and the other corresponding to the same amount of current flowing anticlockwise. "Just as the cat is neither alive nor dead but a ghostly mix of the two possibilities, the current flows neither clockwise or counterclockwise, but is a mix of the two possibilities [133]." According to Friedman, "we can have two of these macroscopically well-defined states at the same time. Which is something of an affront to our classical intuitions about the world [133]."

Current running in both directions simultaneously is nonsensical. Current is a vector and must have only one direction. The energy difference observed by Friedman et al. can be explained CLASSICALLY. The experimental apparatus comprised a small SQUID coupled to a large current loop. A second SQUID magnetometer read the flux state of the first sample SQUID. The energy difference was not due to superposition of flux states. Rather, it was due to the nature of the electron which carries the superconducing current and links flux in units of the magnetic flux quantum. Consequently, the sample SQUID linked zero or one magnetic flux quantum. When excited by electromagnetic radiation of a resonant frequency, individual electrons undergo a spin-flip or Stern Gerlach transition corresponding to a reversal of the electron magnetic moment, angular moment, and current. The Stern Gerlach transition energies of electrons superimpose. The energy difference observed by Friedman et al. matches the energy corresponding to the flux linkage of the magnetic flux quantum by the ensemble of superconducting electrons in their entirety with a reversal of the corresponding macroscopic current. The linkage was caused by high power microwave excitation of a Stern Gerlach transition of the magnetically biased loop which caused a concomitant change in the flux state of the separately magnetically biased sample SQUID. In this case, the microwave frequency was kept constant, and the bias flux of the loop was scanned at a fixed magnetic bias of the sample

SQUID until the resonance with the superposition of the Stern Gerlach transitions of the superconducting electrons in their entirety was achieved.

Flawed Prediction of Perpetual Motion by the Heisenberg Uncertainty Principle

Another consequence of HUP wherein entanglement of states is implicit is the prediction of perpetual motion. Schewe and Stein report on the work of Allahverdyan and Nieuwenhuizen [135]:

"Armen Allahverdyan of, CEA Saclay (France)/University of Amsterdam (Netherlands)/Yerevan Physics Institute (Armenia), aarmen@spht.saclay.cea.fr, and Theo Nieuwenhuizen of the University of Amsterdam (nieuwenh@wins.uva.nl, 011-31-20-525-6332) [136] suggest that a quantum particle (such as an electron) interacting strongly with a reservoir of particles may violate the Clausius inequality--one formulation of the second law of thermodynamics, which states that it is impossible to do work without losing heat. What the researchers term "appalling behavior" can be traced to the quantum mechanical property of entanglement, in which a quantum particle (such as an electron) is so strongly interlinked with another particle or group of particles that the resulting behavior cannot be treated by standard thermodynamic approaches. In this paper, the Amsterdam scientists study the entanglement of a particle with a "quantum thermal bath," a reservoir of particles with which the first particle can exchange energy and momentum. According to the researchers, entanglement prevents the quantum bath from observing the normal requirements for a heat bath. Therefore, thermodynamics simply cannot say anything useful about the system.

Standard thermodynamics dictates that the bath be in thermal equilibrium and not interact strongly with an external object. To the contrary, the bath strongly interacts with something external to it (the entangled particle) and it cannot reach equilibrium, since it constantly exchanges energy and momentum with the particle. At low temperatures where entanglement could be easily preserved, the researchers state that this system can apparently violate the Clausius inequality--in which the heat gained by the particle must be less than or equal to the temperature multiplied by the change in its entropy (or disorder). Near absolute zero temperatures, a situation which would ordinarily require the particle to lose heat, the

researchers show that the particle could gain heat, by the Clausius relation. According to this scenario, applying a cyclic parameter such a periodically varying external magnetic field can cause the entangled particle to extract work from the bath--something forbidden in a classical system. Further, the researchers say that this phenomenon could be said to constitute a perpetual motion machine of the second kind."

121. J. S. Bell, Physics, Vol. 1, (1965), p. 195.
122. D. Bohm, Quantum Theory, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, (1951), p. 614.
123. A. Aspect, P. Grangier and R. Gerard, Physical Review Letters, Vol. 47, No. 7, (1981), pp. 460-463.
124. R. Mills, The Grand Unified Theory of Classical Quantum Mechanics, January 2000 Edition, BlackLight Power, Inc., Cranbury, New Jersey, Distributed by Amazon.com, pp. 511-521.
125. J. F. Clauser et al., Physical Review Letters, Vol. 23, No. 15, (1969), pp. 880-884.
126. M. A. Horne, "Experimental Consequences of Local Hidden Variable Theories", thesis, Boston University, (1969).
127. C. Monroe, D. M. Meekhof, B. E. King, D. J. Wineland, Science, Vol. 272, (1996), pp. 1131-1135.
128. R. Mills, The Grand Unified Theory of Classical Quantum Mechanics, January 2000 Edition, BlackLight Power, Inc., Cranbury, New Jersey, Distributed by Amazon.com, pp. 521-536.
129. M. W. Browne, "Physicist Put Atom in Two Places at Once", New York Times, Tuesday, May 28,1996, pp. B5-B6.
130. G. Taubes, Science, Vol. 272, (1996), p. 1134.
131. J. R. Friedman, V. Patella, W. Hen, S. K. Tolpygo, J. E. Lukens, "Quantum superposition of distinct macroscopic states", Nature, Vol. 406, July, 6, (2000), pp. 43-45.
132. R. Mills, The Grand Unified Theory of Classical Quantum Mechanics, January 2001 Edition, BlackLight Power, Inc., Cranbury, New Jersey, www.blacklightpower.com.
133. K. Chang, The New York Times, Tuesday, July 11, 2000, p. F3.
134. E. Schrodinger, "Die gegenwartige situation in der quantenmechanik," Naturwissenschaften, Vol. 23, (1935), pp. 807-812, 823-828, 844-849.
135. P. F. Schewe and B. Stein, Physic News Update, The American Institute of Physics Bulletin of Physics News, Number 494, July 17, (2000).
136. A. Allahverdyan and T. Nieuwenhuizen, Phys. Rev. Lett., Vol. 85, No. 9, August 28, (2000), pp. 1799-1802.

Randy Mills

Except for a trite reference in his last post to see Bohm's implausible interpretation of QM, none of these issues were ever dealt with by PZ or any of the quantum aficionados on this group or now gone from it which is the basis of my pervious post:

Professionalism

Starting with a post by Aaron Barth and followed by numerous posts by Aaron Barth and Peter Zimmerman, I have been accused of citing astrophysical data which does not actually exist. In reality, Barth has referred to a different journal article and a different spectrum than that which I evaluated and cited. Other spectroscopists who participated in the data analysis or reviewed the data used the same spectrum which I cited rather than another. Whether Barth and Zimmerman's mistake occurred by carelessness or intentionally, I feel that it is only appropriate to restrict criticism to the actual citation rather than fabricate a rebuttal based on substitute data not originally cited. This also applies in the case on CQM. Criticism should only be based directly on my derivations and writings, rather than a misrepresentation. Zimmerman's statements that the spin vector "MUST" be in the direction of motion is but one example.

In addition, often rebuttals to the critics appear to fall on deaf ears, and the critics repeat the same phenomena (such as measurements to which QED is applied) even though careful derivations based on CQM that match the data exactly have been presented. For example, I have made numerous posts and cited my publications which clearly challenge the trappings of QM such as virtual particles surround the electron and shield the charge less effectively as the electron's center is approached, spooky action at a distance, a 9Be+ ion may be in two separate locations at once, supercurrent may go in both directions at once, perpetual motion is predicted, probability waves, virtual particles, negative energy of the vacuum, polarization of the vacuum by virtual particles, renormalization, effective nuclear charge, ionic terms in the perturbation series, fermion propagators, virtual photon annihilation, virtual photon emission and reabsorption, virtual electron positron annihilation, photon propagators, plethora of

postulated super-symmetry virtual particles which make contributions such as smuon-neutralino and sneutrino-chargino loops, neutrino oscillation, worm holes, parallel universes, parallel mind universes, quantum telepathy, entanglement, spooky actions at a distance, dark energy, exotic particles comprising dark matter, the universe from nothing, big bang-inflation,-deceleration-reacceleration of the universe, and so on and so on. CQM explains the data based on reality versus fantastical interpretations of wave equation solutions.

What do the critics have to say about the real world explanations that have been provided? For example, what specifically is the QM answer to the 15 ion mobility peaks observed for electrons in super fluid helium? This data as well as a multitude of other fundamental experiments challenge the foundation of QM (See R. Mills, The Nature of Free Electrons in Superfluid Helium--a Test of Quantum Mechanics and a Basis to Review its Foundations and Make a Comparison to Classical Theory, Int. J. Hydrogen Energy, in press). A recent paper in peer review for three years [LaloŒ, F., "Do we really understand quantum mechanics? Strange correlations, paradoxes, and theorems", Am. J. Phys. 69 (6), June 2001, 655-701] similarly demonstrates that the foundations of QM are nonsensical. The abstract is given infra. Even QM aficionados do not believe that QM describes physical reality. I quote Fuchs and Peres, "Contrary to those desires, quantum theory does NOT describe physical reality." [C. A. Fuchs and A. Peres, "Quantum Theory Needs No "Interpretation", Physics Today, March (2000), p. 70].

In a recent communication to which I have responded [A. K. Vijh, "Hydrino atom: novel chemistry or invalid physics?", Int. J. of Hydrogen Energy, Vol. 26, (2000), p. 281], Vijh cites Robert Park's book, Voodoo science (Footnote 1), and presents the typical mantra: Mills' "state below the ground state [1-4] is, according to Park, a contradiction in terms like "south of the South Pole". It violates the foundations of quantum mechanics: the exact prediction of the hydrogen spectrum was one of the first great triumphs of quantum theory-- the theory accounts perfectly for every spectral line and there is no line corresponding to a "hydrino" state (emphasis added starting at "there") (Footnote 2). Vijh ends with "the foundations of quantum theory are safe". I see this defensive mentality of treating any theory as sacrosanct as the root of why QM and technology predicted by QM has been a dismal failure for the past several decades. QM is stifling innovation and the progress of science. And,

there is an intolerance to new ideas which are attacked without regard to professionalism in an organized pack-like manner. I am not the only one who is concerned about the future of science. Consider Weinstein's letter to Chemical and Engineering News [A. Weinstein, C&EN, May 7, (1990)] given below. What has changed in the past decade since Weinstein's letter was published?

ABSTRACT of LaloŒ, F., Do we really understand quantum mechanics? Strange correlations, paradoxes, and theorems, Am. J. Phys. 69 (6), June 2001, 655-701.

Do we really understand quantum mechanics? Strange correlations, paradoxes, and theorems

This article presents a general discussion of several aspects of our present understanding of quantum mechanics. The emphasis is put on the very special correlations that this theory makes possible: They are forbidden by very general arguments based on realism and local causality. In fact, these correlations are completely impossible in any circumstance, except for very special situations designed by physicists especially to observe these purely quantum effects. Another general point that is emphasized is the necessity for the theory to predict the emergence of a single result in a single realization of an experiment. For this purpose, orthodox quantum mechanics introduces a special postulate: the reduction of the state vector, which comes in addition to the Schr°dinger evolution postulate. Nevertheless, the presence in parallel of two evolution processes of the same object (the state vector) may be a potential source for conflicts; various attitudes that are possible to avoid this problem are discussed in this text. After a brief historical introduction, recalling how the very special status of the state vector has emerged in quantum mechanics, various conceptual difficulties are introduced and discussed. The Einstein‹Podolsky‹Rosen (EPR) theorem is presented with the help of a botanical parable, in a way that emphasizes how deeply the EPR reasoning is rooted into what is often called Òscientific method.Ó In another section the Greenberger‹Horne‹Zeilinger argument, the Hardy impossibilities, as well as Bell‹Kochen‹Specker theorem are introduced in simple terms. The final two sections attempt to give a summary of the present situation: One section discusses nonlocality and entanglement as we see it presently, with brief mention of recent experiments; the last section contains a (nonexhaustive) list of various attitudes that are found among physicists, and that are helpful to alleviate the

conceptual difficulties of quantum mechanics.

C&EN Correspondence by A. Weinstein

Quantum theory

Sir: With regard to Richard C. HenryÕs review of the book, ÒThe Tenth DimensionÓ (C&EN, Jan 22, page 27), I, for one, tired of being bullied by physicist bearing the red herring of quantum theoryÑa failed theory if there ever was one. As was remarked by more than one chemist in these pages over the past two or three decades, literally man-centuries of work have been wasted trying to synthesize compounds that the quantum theory unequivocally states should be stable, only to find that the compounds do not exist I any form whatsoever.

Of course, the physics community itself is deeply divided over the validity of the Schr°dinger equation with about half (as best I can judge) not believing that the equation is a correct, let alone a complete, representation of reality. Einstein was only the most famous of the physicists who dissented from the Schr°dinger formulationÑthere are and were hordes of others. Louis de Broglie fought the theory through all the days of his life, though his famous equation was an integral part of its development.

As things have gone on through the years, the results have been an ever more bizarre progression of ideas and assertions that have finally culminated in what is simply solipsistic nihilismÑÒnothing can exist except what I want to existÓÑas grotesque as it is absurd. The next time you watch your TV screen, just imagine that it isnÕt being lighted up by accelerated electrons at all, just by your own desire.

There is nothing at all wrong with the idea of an electron orbiting around a protonÑthis is exactly what Bohr used to develop his original ideas, in very close agreement with experiment, and based on the redoubtable CoulombÕs law. Aside from leading to all sorts of impossible conundrums and paradoxes, Schr°dingerÕs equation does notÑrepeat notÑpredict all four quantum numbers (it misses spin altogether), and succeeds in only a few very special cases in predicting anything at all that can be subject to precise measurement. For these and many other reasons (including the

destruction of the very logic of science itself), I repeat that legions of physicists have rejected the Schr°dinger quantum formulation, believing at best that the correct and complete theory has yet to be worked out. (Score: a few select successes, and mountains of failures. Sensible theoretical chemists continue to shun quantum theory in droves.)

It is a shame that the educational experiences of most chemists do not permit them to evaluate, let alone see through, this welter of nonsense and confusion, and thus to send the infamous thing (quantum theory) back to its makers with an appropriate whack on its bedraggled tail. You can see the result of this hodgepodge in any introductory chemistry text that you care to open. (Pace Voltaire!)

Although history cannot be altered, future curricula can be adjusted to help prevent another similar fiasco from occurringÑor at least try.

Allan Weinstein
Lawrence, Kan.

Footnote 1. Vijh reference to Park's book is incorrect. These statements can be found on the APS website and Park writings in Forbes magazine. Explicitly from R. Park, "Mills calls it the most important discovery of all time, up there with fire. Could he be right? No." Forbes, May 15, 2000, p. 126:

"Think of an alarm clock that is completely unwound. A physicist would say the rundown clock is in its "ground state." You study the energy spectrum of a particular type of atom by looking at its spectrum--the specific wavelengths emitted as the atom's electrons cascade from an excited state to lower energy levels, ending with the ground state. The exact prediction of the hydrogen spectrum was one of the great triumphs of quantum theory. It is the platform on which our entire understanding of atomic physics is built. The theory accounts perfectly for every spectral line. There is no line corresponding to a "hydrino" state."

Footnote 2. Park is advised to review our 25 journal articles including: R. Mills, P. Ray, "Spectral Emission of Fractional Quantum Energy Levels of Atomic Hydrogen from a Helium-Hydrogen Plasma and the Implications for Dark Matter", Int. J. Hydrogen Energy, submitted; posted at www.blacklightpower.com.

Randy Mills

REGARDING THE GRAVITATIONAL MASS OF THE FREE ELECTRON AND PHOTON

These issues were dealt with in my prior posts:

Only QM Gives Perpetual Motion

Peter Zimmerman wrote:

> +++ Nora Baron has identified the classic form a
>a perpetual motion machine of the first kind (i.e. First Law
>violator), and she has shown that if the gravitational mass
>of the electron is time dependent (in this case because it
>can go from bound to unbound) one can make a wheel turn
>without other input of work -- and that the wheel has the
>ability to do useful work without futher input of work. Tom
>Stolper said that there remained details to work out. Yes,
>but those are 'practical' engineering difficulties rather
>than conceptual barriers which would stand in the way of a
>Gedankenexperiment working.
>
>As John Kassebaum pointed out, in the real world for such a
>thing to be possible is absurd. Which is quite a blow to
>the standard Mills version of the electron.

(The equations which are shown in the attachment are not shown below -- only the text. If problems are encountered in opening this document, contact bstepien@blacklightpower.com or BLP's IT manager may be contacted after 8/5 at dreilly@blacklightpower.com.)

As shown in the attachment, the CQM theory of gravitation is consistent with first principle laws including conservation of energy with respect to gravitation of the free electron. Whereas, an inescapable consequence of the Heisenberg Uncertainty Principle is the prediction of an infinite cosmological constant and a perpetual motion machine of the first kind. Another consequence of the

Heisenberg Uncertainty Principle wherein entanglement of states is implicit is the prediction of a perpetual motion machine of the second kind. These and other nonsensical predictions of QM demonstrate that this theory is fatally flawed [Footnote 1].

Summary of Some Points Regarding the CQM Theory of Gravitation [1]:

- For or any kind of wave advancing with limiting velocity and capable of transmitting signals, the equation of front propagation is the same as the equation for the front of a light wave. By applying the condition to electromagnetic and gravitational fields at particle production, the Schwarzschild metric (SM) is derived from the classical wave equation which modifies general relativity to include conservation of spacetime in addition to momentum and matter/energy. The result gives a natural relationship between Maxwell's equations, special relativity, and general relativity. It gives gravitation from the atom to the cosmos.

- The Schwarzschild metric gives the relationship whereby matter causes relativistic corrections to spacetime that determines the curvature of spacetime and is the origin of gravity. The correction is based on the boundary conditions that no signal can travel faster that the speed of light including the gravitational field that propagates following particle production from a photon wherein the particle has a finite gravitational velocity given by Newton's Law of Gravitation.

- The limiting velocity results in the contraction of spacetime due to particle production. The contraction is given by where is the gravitational radius of the particle. This has implications for the expansion of spacetime when a matter converts to energy.

- The spacetime contraction during particle production is analogous to Lorentzian length contraction and time dilation of an object in one inertial frame relative to another moving at constant relative velocity. In the former case, the corresponding correction is a function of the square of the ratio of the gravitational velocity to the speed of light. In the latter case, the corresponding correction is a function of the square of the ratio of the relative velocity of two inertial frames to the speed of light.

• Fundamental particle production occurs when the energy of the particle given by the Planck equation, Maxwell's Equations, and Special Relativity is equal to , and the proper time is equal to the coordinate time according to General Relativity. The gravitational equations with the equivalence of the particle production energies permit the equivalence of mass/energy and the spacetime metric from which the gravitational constant and the masses of the leptons, the quarks, and nucleons are derived.

• The gravitational equations with the equivalence of the particle production energies permit the conservation relationship of mass/energy by ( ) and spacetime ( ). Spacetime expands as mass is released as energy which provides the basis of the atomic, thermodynamic, and cosmological arrows of time. Entropy and the expansion of the universe are large scale consequences. The universe is closed independently of the total mass of the universe, and different regions of space are isothermal even though they are separated by greater distances than that over which light could travel during the time of the expansion of the universe. The universe is oscillatory in matter/energy and spacetime with a finite minimum radius, the gravitational radius; thus, the gravitational force causes celestial structures to evolve on a time scale that is greater than the period of oscillation. The equation of the radius of the universe, , is . The calculated Hubble constant is . Presently, stars exist which are older than the elapsed time of the present expansion as stellar evolution occurred during the contraction phase. The maximum energy release of the universe which occurs at the beginning of the expansion phase is .

• The relationship between inertial and gravitational mass is based on the relationship between Maxwell's equations, special, and general relativity. Spacetime has an experimentally measurable permittivity and permeability which provides a limiting velocity, . This is the key to understanding the relationship between inertial and gravitational mass. Lorentzian contraction and other aspects of special relativity arise from the limiting velocity given a particle propagation velocity. The limiting velocity further results in the contraction of spacetime due to particle production which gives rise to a gravitational field.

• In addition to the propagation velocity, the intrinsic velocity of the particle and the geometry of this 2D velocity surface with respect to the limiting speed of light determines that the particle such as an

electron may have gravitational mass different from its inertial mass. A constant velocity confined to a spherical surface corresponds to a positive gravitational mass equal to the inertial mass (e.g. particle production or a bound electron). A hyperbolic velocity function confined to a flat surface corresponds to a gravitational mass less than the inertial mass which is zero in the limit of an absolutely unbound particle (e.g. absolutely free electron). A hyperbolic velocity function confined to a spherical surface corresponds to a negative gravitational mass (e.g. hyperbolic electron).

A partial listing of the particle and cosmological phenomena derivable from CQM in closed form equations with fundamental constants only is given in Table 1. There is remarkable agreement between predictions and observations [1-3].

Table 1. Partial List of Particle and Cosmological Phenomena Solved by CQM.

• deflection of light by stars • the power spectrum of the universe
• the precession of the perihelion of Mercury • the microwave background temperature
• the lepton masses • the uniformity of the microwave background radiation
• the quark masses • the microkelvin spatial variation of the microwave background radiation (DASI)
• the Hubble constant • the observed violation of the GZK cutoff
• the age of the universe • the mass density of the universe
• the observed acceleration of the expansion • the large scale structure of the universe
• the power of the universe

Consequences of CQM Gravity:

• The photon has no gravitational mass. As shown in Chp. 23 of R. Mills [1]:

In Einstein's gravity equation, the Einstein tensor and the stress-energy-momentum tensor are each conservative. This forces conservation of curvature and conservation of mass-energy and momentum. Consequentially, a photon and a gravitational field with corresponding energies must each produce a gravitational field corresponding to the equivalent mass. However, for any kind of wave advancing with limiting velocity and capable of transmitting

signals, the equation of front propagation is the same as the equation for the front of a light wave. If gravity propagates at the speed of light, light travels at in all inertial frames, and light gives rise to a gravitation field, then an internal inconsistency arises regarding causality.

Conservation of mass-energy and momentum under the law of the limiting propagation velocity based on Maxwell's equations requires conservation of spacetime with matter-energy and momentum but nonconservation of curvature. Thus, the wave equation conserves matter, energy, and momentum. It further provides for the conservation of these physical entities with spacetime and provides a unifying physical principle that gives an oscillating universe with predictions that are consistent with observation.

Furthermore, in the calculation of the deflection of light by a gravitational field, the mass of the photon was set equal to zero in the Deflection of Light section at Eq. (23.108). The agreement of the observed deflection with that predicted with m=0 confirms that the photon has zero gravitational mass.

• If the electric and magnetic fields are completely eliminated from a region of vacuum space containing an electron such that the electron is completely free and unbound, it may be possible to measure an electron gravitational mass that is less than the inertial mass m sub e. The gravitational mass may approach zero in the limit of the electron being absolutely free. With the exclusion of essentially all electromagnetic fields, Witteborn [4] experimentally measured the gravitational mass of the free electron using a free fall technique. The reported result was less than 0.09 m sub e0.09 m_e, where m sub e is the inertial mass of the free electron 9.109534 X10^-34 kg.

No perpetual motion scheme is possible, since matter, energy and spacetime are conserved. Absorption of photons by matter occurs with conservation of mass-energy. The inertial and gravitational mass of matter may increase. The conservation of spacetime must also be considered which always forces conservation of mass-energy with regard to gravitation. If an electron is ionized, the ionizing photon propagating at the speed of light is replaced by electric fields of the particles propagating at the speed of light. Due to the current distribution of the electron in the complete absence of fields given by Eq. (3.11 of reference 1) and the limiting velocity condition, the free electron may have a gravitational mass less than its inertial mass, And, the gravitational mass may approach zero in

the free limit.

The universe is electrically neutral. As shown in Chps. 2, 19, and 20 of R. Mills [1], photons may give rise to a corresponding surface charge on which electric field lines may terminate. As given in Chps. 19 and 20 of R. Mills [1]

With the substitution of Eq. (19.7) and the appropriate special relativistic corrections into the orbitsphere energy equations, the following energies, written in general form, are equal

(19.8)

where is the potential energy. In the case of an electron orbitsphere, the rest mass , the radius , and the electron and positron each experience an effective charge of

(19.9)

Thus, considering the relativistic invariance of charge for the electron, in order to cancel all of the fields between an electron and a nucleus from which it is ionized, 510 keV per electron must be provided in terms of captured photons or the equivalent electric or magnetic stored energies. Then the contraction of spacetime due to capture of photons of zero gravitational mass equals the expansion of spacetime corresponding to the formation of an electron which is free of any fields and has gravitational mass that approaches zero. Spacetime is conserved, which forces mass-energy conservation independently of mass-energy conservation during photon absorption or the storing of electric or magnetic energies.

NOW LET'S TAKE AT CLOSE LOOK AT THE QM PREDICTIONS REGARDING THE FREE ELECTRON AND GRAVITY:

• The Schrödinger equation predicts that each of the functions that corresponds to a highly excited state electron is not integrable and can not be normalized; thus, each is infinite.

• The Schrödinger equation predicts that the ionized electron is sinusoidal over all space and can not be normalized; thus, it is infinite.

In particular, it is shown by Mills [5-6] that the solution of the Schrödinger corresponds to the case wherein fails to vanish. Thus, the solutions with sufficiently large are infinite. The same problem arises in the case of a free electron that is ionized from hydrogen. If is imaginary, which means that is positive, Eq. (42) is the equation of a linear harmonic oscillator [7]. shows sinusoidal behavior; thus, the wavefunction for the free electron can not be normalized and is infinite. Also see [8].

Quantum Mechanics is an Incomplete Theory Since It Does Not Explain Gravity or Particle Masses [6].

Quantum mechanics can not explain the existence of particles with precise masses and gives no basis of gravity. If fact, a straight forward application of the Uncertainty Principle predicts that particles of precise mass/energy can not exist. These shortcomings are compounded by the prediction of zero-point field fluctuations, virtual particles, and states of negative energy and mass invoked to describe the vacuum. These consequences of the Uncertainty Principle are nonsensical and have no basis in reality since they have never been observed experimentally. For example, the Rutherford experiment demonstrated that even atoms are comprised of essentially empty space [9]. These consequences of QM would also correspond to an essentially infinite cosmological constant throughout the entire universe including regions of no mass. As given by Waldrop [10], "What makes this problem into something more than metaphysics is that the cosmological constant is observationally zero to a very high degree of accuracy. And yet, ordinary quantum field theory predicts that it ought to be enormous, about 120 orders of magnitude larger than the best observational limit. Moreover, this prediction is almost inescapable because it is a straightforward application of the Uncertainty Principle, which in this case states that every quantum field contains a certain, irreducible amount of energy even in empty space. Electrons, photons, quarks--the quantum field of every particle contributes. And that energy is exactly equivalent to the kind of pressure described by the cosmological constant. The cosmological constant has accordingly been an embarrassment and a frustration to every physicist who has ever grappled with it."

Furthermore, according to the Heisenberg Uncertainty principle of QM, matter may be created from nothing, including vacuum. Taking quantum theory into account, Stephen Hawking [11-12] mathematically proved that blackholes must emit Hawking radiation

comprising photons, neutrinos, and all sorts of massive particles. "The surface emits with equal probability all configurations of particles compatible with the observers limited knowledge. It is shown that the ignorance principle holds for quantum-mechanical evaporation of blackholes: The black hole creates particles in pairs, with one particle always falling into the hole and the other possibly escaping to infinity [12]." This QM theorem represents a perpetual motion machine with regard to spontaneous creation of mass and energy from the vacuum and with regard to gravitation. (QM also predicts a perpetual motion machine of the second kind, see Footnote 2). Contrary to prediction, Hawking radiation has never been observed [13-15]. Classical laws including conservation of matter-energy are confirmed and QM is invalidated.

Footnote 1. Abstract of reference 6:

The Schrödinger equation was originally postulated in 1926 as having a solution of the one electron atom. It gives the principal energy levels of the hydrogen atom as eigenvalues of eigenfunction solutions of the Laguerre differential equation. But, as the principal quantum number $n>>1$, the eigenfunctions become nonsensical. Despite its wide acceptance, on deeper inspection, the Schrödinger solution is plagued with many failings as well as difficulties in terms of a physical interpretation that have caused it to remain controversial since its inception. Only the one electron atom may be solved without approximations, but it fails to predict electron spin and leads to models with nonsensical consequences such as negative energy states of the vacuum, infinities, and negative kinetic energy. In addition to many predictions which simply do not agree with observations, the Schrödinger equation predicts noncausality, nonlocality, spook actions at a distance or quantum telepathy, perpetual motion, and many internal inconsistencies where contradicting statements have to be taken true simultaneously. Recently, the behavior of free electrons in superfluid helium has again forced the issue of the meaning of the wavefunction. Electrons form bubbles in superfluid helium which reveal that the electron is real and that a physical interpretation of the wavefunction is necessary. Furthermore, when irradiated with light of energy of about a 0.5 to several electron volts [1], the electrons carry current at different rates as if they exist with different sizes. It has been proposed that the behavior of free electrons in superfluid helium can be explained in terms of the electron breaking into pieces at superfluid helium temperatures [1]. Yet, the electron has proven to be indivisible even under particle accelerator collisions at 90 GeV

(LEPII). The nature of the wavefunction must now be addressed. It is time for the physical rather than the mathematical nature of the wavefunction to be determined. A theory of classical quantum mechanics (CQM) was derived from first principles by Mills [2] that successfully applies physical laws on all scales. Using the classical wave equation with the constraint of nonradiation based on Maxwell's equations, CQM gives closed form physical solutions for the electron in atoms, the free electron, and the free electron in superfluid helium. The prediction of fractional principal quantum energy states of the electron in liquid helium match the photoconductivity and mobility observations without requiring that the electron is divisible.

Footnote 2. Flawed Prediction of Perpetual Motion by the Heisenberg Uncertainty Principle (HUP)

Another consequence of HUP wherein entanglement of states is implicit is the prediction of perpetual motion [6]. Schewe and Stein report on the work of Allahverdyan and Nieuwenhuizen [16]:

"Armen Allahverdyan of, CEA Saclay (France)/University of Amsterdam (Netherlands)/Yerevan Physics Institute (Armenia), aarmen@spht.saclay.cea.fr, and Theo Nieuwenhuizen of the University of Amsterdam (nieuwenh@wins.uva.nl, 011-31-20-525-6332) [17] suggest that a quantum particle (such as an electron) interacting strongly with a reservoir of particles may violate the Clausius inequality--one formulation of the second law of thermodynamics, which states that it is impossible to do work without losing heat. What the researchers term "appalling behavior" can be traced to the quantum mechanical property of entanglement, in which a quantum particle (such as an electron) is so strongly interlinked with another particle or group of particles that the resulting behavior cannot be treated by standard thermodynamic approaches. In this paper, the Amsterdam scientists study the entanglement of a particle with a "quantum thermal bath," a reservoir of particles with which the first particle can exchange energy and momentum. According to the researchers, entanglement prevents the quantum bath from observing the normal requirements for a heat bath. Therefore, thermodynamics simply cannot say anything useful about the system.

Standard thermodynamics dictates that the bath be in thermal equilibrium and not interact strongly with an external object. To the contrary, the bath strongly interacts with something external to it (the entangled particle) and it cannot reach equilibrium, since it

constantly exchanges energy and momentum with the particle. At low temperatures where entanglement could be easily preserved, the researchers state that this system can apparently violate the Clausius inequality--in which the heat gained by the particle must be less than or equal to the temperature multiplied by the change in its entropy (or disorder). Near absolute zero temperatures, a situation which would ordinarily require the particle to lose heat, the researchers show that the particle could gain heat, by the Clausius relation. According to this scenario, applying a cyclic parameter such a periodically varying external magnetic field can cause the entangled particle to extract work from the bath--something forbidden in a classical system. Further, the researchers say that this phenomenon could be said to constitute a perpetual motion machine of the second kind."

References:

1. R. Mills, The Grand Unified Theory of Classical Quantum Mechanics, July 2001 Edition, BlackLight Power, Inc., Cranbury, New Jersey, posted at www.blacklightpower.com.
2. R. Mills, "The Grand Unified Theory of Classical Quantum Mechanics", Global Foundation, Inc. Orbis Scientiae entitled The Role of Attractive and Repulsive Gravitational Forces in Cosmic Acceleration of Particles The Origin of the Cosmic Gamma Ray Bursts, (29th Conference on High Energy Physics and Cosmology Since 1964) Dr. Behram N. Kursunoglu, Chairman, December 14-17, 2000, Lago Mar Resort, Fort Lauderdale, FL, in press, posted at www.blacklightpower.com.
3. R. Mills, "The Grand Unified Theory of Classical Quantum Mechanics", Int. J. Hydrogen Energy, submitted, posted at www.blacklightpower.com.
4. Witteborn, F. C., and Fairbank, W. M., Physical Review Letters, Vol. 19, No. 18, (1967), pp. 1049-1052.
5. R. Mills, "The Hydrogen Atom Revisited", Int. J. of Hydrogen Energy, Vol. 25, Issue 12, December, (2000), pp. 1171-1183, posted at www.blacklightpower.com.
6. R. Mills, The Nature of Free Electrons in Superfluid Helium--a Test of Quantum Mechanics and a Basis to Review its Foundations and Make a Comparison to Classical Theory, Int. J. Hydrogen Energy, in press, posted at www.blacklightpower.com.
7. Fowles, G. R., Analytical Mechanics, Third Edition, Holt, Rinehart, and Winston, New York, (1977), pp. 57-60.
8. H. Margenau, G. M. Murphy, The Mathematics of Chemistry and Physics, D. Van Nostrand Company, Inc., New York, (1943), pp. 363-

367.
9. Beiser, A., Concepts of Modern Physics, Fourth Edition, McGraw-Hill Book Company, New York, (1978), pp. 119-122.
10. M. M. Waldrop, Science, Vol. 242, December, 2, (1988), pp. 1248-1250.
11. S. W. Hawking, "Particle creation by black holes", Commun. Math Phys., Vol. 43, (1975), pp. 199-220.
12. S. W. Hawking, Phys. Rev. D, Vol. 14, (1976), pp. 2460-2473.
13. M. A. Seeds, Foundations of Astronomy, 1st Edition, Brooks/Cole, Pacific Grove, CA, (1980).
14. Sky and Telescope Magazine, Feb. (1978), p. 113.
15. Sky and Telescope Magazine, Aug. (1977), p. 84.
16. P. F. Schewe and B. Stein, Physic News Update, The American Institute of Physics Bulletin of Physics News, Number 494, July 17, (2000).
17. A. Allahverdyan and T. Nieuwenhuizen, Phys. Rev. Lett., Vol. 85, No. 9, August 28, (2000), pp. 1799-1802.

Randy Mills

Also at footnotes 1 and 2 at pages 500 and 501, respectively, of R. Mills, The Grand Unified Theory of Classical Quantum Mechanics, www.blacklightpower.com appears:

1. If the electric and magnetic fields are completely eliminated from a region of vacuum space containing an electron such that the electron is completely free and unbound, it may be possible to measure an electron gravitational mass that is less than the inertial mass m sub e. The gravitational mass may approach zero in the limit of the electron being absolutely free. With the exclusion of essentially all electromagnetic fields, Witteborn [4] experimentally measured the gravitational mass of the free electron using a free fall technique. The reported result was less than 0.09 m sub e, where m sub e is the inertial mass of the free electron 9.109534 X10^-34 kg.

No perpetual motion scheme is possible, since matter, energy and spacetime are conserved. Absorption of photons by matter occurs with conservation of mass-energy. The inertial and gravitational mass of matter may increase. The conservation of spacetime must also be considered which always forces conservation of mass-energy with regard to gravitation. If an electron is ionized, the ionizing photon propagating at the speed of light is replaced by electric fields of the particles propagating at the speed of light. Due to the current distribution of the electron in the complete absence of fields given by Eq. (3.11) and the

limiting velocity condition, the free electron may have a gravitational mass less than its inertial mass, And, the gravitational mass may approach zero in the free limit.

The universe is electrically neutral. As shown in the Excited States of the One-Electron Atom (Quantization), Creation of Matter from Energy, and Pair Production sections, photons may give rise to a corresponding surface charge on which electric field lines may terminate. As given in the Creation of Matter from Energy section (also see the Pair Production section):

> With the substitution of Eq. (19.7) and the appropriate special relativistic corrections into the orbitsphere energy equations, the following energies, written in general form, are equal
>
> E=hbar omega*=mc^2=V $(E=\hbar\omega^*=m_0c^2=V)$ (19.8)
>
> where V (V) is the potential energy. In the case of an electron orbitsphere, the rest mass m=m sub e $(m_0=m_e)$, the radius r=alpha a sub zero $(r_\alpha^*=\alpha a_o)$, and the electron and positron each experience an effective charge of
> alpha^-1 e $(\alpha^{-1}e)$.
>
> V=(alpha^-1 e^2)/(4pi elpsilon zero alpha a zero)
>
> $(V=\frac{\alpha^{-1}e^2}{4\pi\varepsilon_o\alpha a_o})$ (19.9)

Thus, considering the relativistic invariance of charge for the electron, in order to cancel all of the fields between an electron and a nucleus from which it is ionized, 510 keV per electron must be provided in terms of captured photons or the equivalent electric or magnetic stored energies. Then the contraction of spacetime due to capture of photons of zero gravitational mass equals the expansion of spacetime corresponding to the formation of an electron which is free of any fields and has gravitational mass that approaches zero. Spacetime is conserved, which forces mass-energy conservation independently of mass-energy conservation during photon absorption or the storing of electric or magnetic energies.

The energy to ionize an electron is a very small fraction of the 510 keV that is required to identically cancel the field from the nucleus from which the electron is ionized. For example, this can be accomplished with a drift tube described by Witteborn [4] with energy stored in electric and magnetic fields of the corresponding to photons which when propagating have zero gravitational mass and have mass equivalent to their energy according to E=mc^2 $(E=mc^2)$ when bound. Thus, creation of a completely free electron with a gravitational mass that approaches zero requires an

increase in gravitational mass due to trapped fields corresponding to photons of exactly the same magnitude. Thus, mass/energy and gravitational energy are conserved, and no perpetual motion machine is predicted or permitted.

2. Witteborn [4] explains the observation that free electrons floated in the drift tube by a postulated Schiff - Barnhill effect wherein the electrons in the metal of the drift tube fall in the Earth's gravitational field to produce an electric field which identically balances the force of gravity on the free electrons in the drift tube. This explanation is absolutely untenable. The binding energy of electrons in metals is typically 5 eV; whereas, the gravitational potential energy over atomic dimensions is over 20 orders of magnitude less and is give by E=m sub e gh ($E=m_e gh$) where m sub e (m_e) is the mass of the electron, g (g) is the acceleration of gravity, and h (h) is the metal internuclear spacing, about 10^-10 m (10^{-10} m.)

PZ totally missed the 20 orders of magnitude discrepancy between the binding and gravitational energies of electrons in metals in his interpretation of the Witteborn experimental results:

John A. Kassebaum wrote:

>Thus, I think Dr. Mills is just hedging his bets. He just want to be
>clear about
>what a 'free' electron is. Its seems likely to me that conduction
>electrons in
>metals and ionized electrons in plasmas are free in the same sense,
its
>just harder
>to model.

The binding energies of electrons in metals are typically around 5 eV;
whereas, the gravitational potential energy over atomic dimensions is of
the order of 1 X 10^-21 eV. Thus, metals are electrically neutral and there is no reported measurable electric field produced by the gravitational force. There are very strong electrical restoring forces in plasmas as well which result in ambipolar drift of electrons paired with ions.

Randy Mills

AND

>Mills wrote:
>
>The binding energies of electrons in metals are typically
>around 5 eV;
>   whereas, the gravitational potential energy
>over atomic dimensions is of
>   the order of 1 X 10^-21 eV. Thus, metals
>are electrically neutral and
>   there is no reported measurable electric
>field produced by the
>   gravitational force. There are very strong
>electrical restoring forces
>   in plasmas as well which result in
>ambipolar drift of electrons paired
>   with ions.
>
>   Randy Mills
>
>
Peter Zimmerman wrote:

>>***This is clear as mud. The gravitational potential energy
>>of WHAT over those distances? You need to specify a mass, a
>>radius for the mass, etc. And a mass for the test mass. The
>>statement as written is incomprehensible.
>
>>As for no reported measurable electric field produced by
>>gravity, Schiff - Barnhill states precisely the opposite.

E=mgh where m is the mass of the electron, g is the acceleration of gravity, and h is the metal internuclear spacing, about 5 X10^-11 m.

I would add the Schiff - Barnhill effect to the list of other nonsensical quantum mechanical interpretations of data discussed in my post of 7/12
such as:

1.) virtual particles surround the electron and shield the charge less

effectively as the electron's center is approached,
2.) spooky action at a distance,
3.) a 9Be+ ion may be in two separate locations at once,
4.) supercurrent may go in both directions at once,
5.) perpetual motion is predicted
6.) dark energy is causing the expansion of the universe to accelerate

Then there is reality:

1.) the electron charge density is greatest in center,
2.) photon momentum is conserved on a photon by photon basis rather than
statistically as predicted by quantum mechanics,
3.) the fluorescence emission spectrum of a Penning trapped 9Be+ ion shows interference peaks due to coupling between oscillator modes and a
Stern Gerlach transition,
4.) the energy difference of a superconducting loop observed by Friedman
et al. matches the energy corresponding to the flux linkage of the magnetic flux quantum by the ensemble of superconducting electrons in
their entirety with a reversal of the corresponding macroscopic current,
5.) perpetual motion is not permitted or observed
6.) the spacetime expands as matter is converted into energy

Randy Mills

The irony of PZ's position is that according to standard general relativity, the solution of the deflection of light in a gravitational field requires that the gravitational mass of the photon be zero. To avoid an inconsistency with the equivalence principle, a hand-waving argument is offered wherein the parameter m in Eq. (23.81) which is unequivocally the gravitational mass somehow becomes the photon rest mass. As shown in Cosmology section and in the post above, since the gravitational field and the photon both travel at the speed of light, the photon can not give rise to a gravitational field without violating causality. The zero rest mass argument is made further internally inconsistent by invoking special relativity to magically make the rest mass of the photon be zero, but special relativity absolutely requires that the speed of the photon be c for all inertial frames with the absence of a special frame. Specifically,

the frame in terms of the historical data is that of an Earth observer, not a photon rest frame. This point was made again in my previous post:

Peter Zimmerman wrote:

>++Is the good doctor serious when he speaks of bound
>photons?

I acknowledge that QM has no description for the photon or photons in excited states of atoms as given by CQM at Chp 4 and 2, respectively. But, surely any competent physicist would know that stored electric or magnetic energy can be converted into photons (i.e. stored electromagnetic energy is different from matter and that it corresponds to photons). You must appreciate that electromagnetic energy in a resonator cavity, a maser, and a laser can be considered bound and corresponds to photons. The energy in a capacitor discharges to give photons. The energy in a solenoid dissipates as photons, etc., etc.

>Is he serious when he says that propagating
>photons have no gravitational mass? If he is, then how does
>he explain gravitational lensing effects -- whether of light
>travelling around distant masses, or the simpler case of
>starlight passing close to the limb of the sun and observed
>during a total eclipse.
>
>Does Dr. Mills forget that this experiment was done the
>first time around 80 years ago? And that the effects are
>seen frequently in deep-space images? And that the degree
>of bending is a sensitive test of General Relativity?

The derivation appears on p.427 to p. 431 of R. Mills, The Grand Unified Theory of Classical Quantum Mechanics, July 2001 Edition, BlackLight Power, Inc., Cranbury, New Jersey, posted at www.blacklightpower.com where I have explicitly indicated where CQM deviates from the past approach:

"The results obtained in the Precession of the Perihelion section can be applied to light propagation in gravitational fields wherein the

gravitational mass of light is zero (rather than the rest mass of light is zero as typically given [5]). Substitution of m in Eq. (23.81) gives....."

Also from my post of 7/30:

¥ The photon has no gravitational mass. As shown in Chp. 23 (p.437) of R. Mills [1]:

In Einstein's gravity equation, the Einstein tensor and the stress-energy-momentum tensor are each conservative. This forces conservation of curvature and conservation of mass-energy and momentum. Consequentially, a photon and a gravitational field with corresponding energies must each produce a gravitational field corresponding to the equivalent mass. However, for any kind of wave advancing with limiting velocity and capable of transmitting signals, the equation of front propagation is the same as the equation for the front of a light wave. If gravity propagates at the speed of light, light travels at c in all inertial frames, and light gives rise to a gravitation field, then an internal inconsistency arises regarding causality.

Conservation of mass-energy and momentum under the law of the limiting propagation velocity based on Maxwell's equations requires conservation of spacetime with matter-energy and momentum but nonconservation of curvature. Thus, the wave equation conserves matter, energy, and momentum. It further provides for the conservation of these physical entities with spacetime and provides a unifying physical principle that gives an oscillating universe with predictions that are consistent with observation.

Furthermore, in the calculation of the deflection of light by a gravitational field, the mass of the photon was set equal to zero in the Deflection of Light section at Eq. (23.108). The agreement of the observed deflection with that predicted confirms that the photon has zero gravitational mass.

Randy Mills

Furthermore, competent physicists realize that 500 keV is only 8 X 10-14 J which is trivial. This energy must be expended to perform the Witteborn [4] experiment (which involves tests on individual electrons rather that 10^23 electrons) in order to preserve conservation of energy and charge neutrality while creating an

electron absolutely free of any electrical fields.

Randy Mills

Partner Sites:
· Newsweek.com
Britannica Internet Guide

Related Items
Print Edition

On Our Site

Perpetual Motion: Still Going Around

By Robert L. Park
Special to The Washington Post
Wednesday, January 12, 2000; Page H03

"Every one of you can be disconnected from the central power grid and never pay another electric bill as long as you live!" That's what Dennis Lee promised an audience of several hundred in the gymnasium of a rural high school near Columbus, Ohio, earlier this year.

They were there, and I was there, because of a full-page ad in USA Today. In letters two inches tall, its headline asked:

Tired of High Electric Bills . . . How About NO Electric Bills?

Columbus was just one stop on a tour of 45 cities across the nation to demonstrate the revolutionary new technology that Lee says can provide infinite free electricity. The centerpiece of his three-hour presentation was an odd-looking contraption of belts and pulleys that he calls "counter-rotation technology."

He says it makes use of something called the "Fourth Law of Motion." Presumably, that allows his gizmo to evade the limitations of Newton's Third Law of Motion -- for every action, there is an equal and opposite reaction.

According to Lee, counter-rotation technology, combined with "permanent magnet motors that are more than 200 percent efficient," can produce infinite free electricity.

But there is no Fourth Law of Motion. And a machine that produces more energy than it is required to run it would violate the most fundamental law of physics, the conservation of energy.

Lee is something of a throwback in the free energy game. The various schemes that his company, Better World Technologies, Inc., has promoted over the years are classical perpetual motion devices from a bygone era.

They rely not on exotic new physics but on a misunderstanding of centuries-old physics -- Isaac Newton's laws of motion and Michael Faraday's laws of electromagnetism, among others. Nonetheless, despite centuries of evidence to the contrary, such claims still have the power to bamboozle and have been doing so for a long time.

An Old Dream

In 1618, a London physician named Robert Fludd thought that he had a way to turn a water wheel without depending on nature to provide a millstream. He would use the wheel's rotation to drive a water pump. The water that had turned the wheel would be pumped back to the top, where it could fall again. A mill powered by this device would run indefinitely.

Alas, the amount of energy supplied by a water wheel cannot exceed the weight of the water that hits its paddles multiplied by the distance the water descends in turning the wheel. It would take the same amount of energy to raise the water back to the top of the wheel as the falling water produced in the first place. No energy would be left to grind flour.

Of course, the concept of energy or "work" as a measurable quantity did not exist in the 17th century. Fludd's idea failed, but his failure led others to one of history's greatest scientific insights and helped to pave the way for the industrial revolution.

It would be another 200 years before the flaw in Fludd's machine would be stated in the form of a fundamental law of nature: Energy is neither created nor destroyed. But it is conserved. That is, there is always exactly the same amount of total energy around after something happens than there was before it happened.

Written as a mathematical equation, that is known as the First Law of Thermodynamics. There is no firmer pillar of modern science. It explains why a ball, no matter what it's made of, can never bounce higher than the point from which it's dropped. That's consistent with our everyday experience: You can't get something for nothing.

But Wait, There's More

Even if it ground no flour, Fludd's water wheel still could not be kept turning. Energy losses, including the heat generated by friction in the machinery, are inevitable. That's embodied in the Second Law of Thermodynamics. Our bouncing ball can never bounce quite as high as the point from which it was dropped.

The first law says you can't win; the second law says you can't even break even.

In the 400 years since Fludd's failure, thousands of inventors have tried to beat the laws of thermodynamics. The laws always won. In frustration, and perhaps embarrassment, many inventors have resorted to fraud, constructing complex devices with cleverly concealed sources of energy. Each failure, each fraud exposed, established the laws of thermodynamics more firmly.

In 1911, the U.S. patent commissioner, exasperated by the time wasted on these impossible ideas, ruled that patent applications for

perpetual motion machines could not be submitted until one year after an operating model was filed with the patent office.

If the machine was still running at the end of the year, the application would be accepted. The new ruling seemed to bring an end to patent applications for perpetual motion machines.

In 1983, however, Joseph Newman, a mechanic from Lucedale, Miss., sought to patent an "energy machine" that he said produced more energy than was needed to run it. Newman insisted that his invention was not a perpetual motion machine and asserted that the energy came from conversion of mass into energy according to Einstein's famous equation E = mc2. Nuclear power comes from this conversion, but Newman's was not nuclear power.

Slowly, Newman said, his machine was devouring its own copper wires and iron magnets. Because c2 (the speed of light squared) is such a huge number, his machine would, for all practical purposes, last forever.

Unimpressed, the patent examiner rejected Newman's application. Not a man to be pushed around, Newman filed suit in federal court to force the Patent and Trademark Office to grant a patent for "an unlimited source of energy."

Could Joe Newman, a simple mechanic, have discovered a way to convert copper and iron into electrical energy? A federal judge ordered Newman to turn his energy machine over to what then was called the National Bureau of Standards for testing. Properly measured, the output power was found to be much less than the input power. Newman lost his suit.

But his failure, like that of Fludd, made a contribution. His suit, Newman v. Quigg now is cited as the legal justification for rejecting all patent applications involving perpetual motion. The conservation of energy thus became the law of the land as well as a law of nature.

Beating the System

Nonetheless, plenty of people still claim to have discovered infinite sources of free energy. Indeed, a worldwide network of passionate free energy believers resides just beyond the fringes of the scientific community.

These people generally shun old-fashioned terms such as "perpetual motion." Instead, they speak a language laced with words and symbols drawn from modern cosmology and atomic physics. They may even believe it to be science, just as witches and faith healers may truly believe that they can summon supernatural powers.

Ignored or even ridiculed by other scientists, they dream of redemption when the world finally realizes to the truth. They even have their own magazine, Infinite Energy, which fills its pages with rosy stories about progress in the quest for free energy, particularly cold fusion. The progress is hard for a nonbeliever to see.

Never. less, these claims attract investors.

For example, BlackLight Power of Princeton, N.J., raised $10 million from power companies on the word of its founder, Randall Mills, that he had discovered a way to produce inexhaustible, low-cost, non-polluting energy from ordinary water. The method: shrinking the hydrogen atoms into an energy state below their ground state. He calls these shrunken hydrogen atoms "hydrinos."

Atoms can absorb energy, much as energy is stored in the spring of an alarm clock when you wind it. As the clock ticks, the energy is released bit by bit in sound waves, friction and the motion of the clockworks. When the clock is fully wound down, a physicist would say it's in its "ground state" -- the state of lowest energy. A state below the ground state is a contradiction of terms.

Mills, whose degree is in medicine and who has no record of accomplishment in physics, describes this as "the most important discovery of all time . . . up there with fire." Could he be right? Could there be a state of hydrogen that other scientists had missed?

No.

The energy states of atoms are studied through their atomic spectra -- light emitted at very specific wavelengths when electrons make a jump from one energy level to another. The exact prediction of the hydrogen spectrum was one of the first great triumphs of quantum theory; it is the platform on which our entire understanding of atomic physics is built. The theory accounts perfectly for every spectral line.

There is no line corresponding to a "hydrino" state. Indeed, there is no credible evidence at all to support Mills' claim.

Weighty Matters

So many companies are claiming to have discovered free energy that additional claims are needed to set one apart from the competition.

James Patterson, an avuncular, white-haired 75-year-old who complains that his wonderful discoveries take time from fishing, says he also can produce unlimited, non-polluting energy from ordinary water with a device similar to the electrolytic cells of BlackLight Power. But he says the Patterson Power Cell also neutralizes radioactivity.

It would be difficult to find a nuclear physicist who would take such a claim seriously. The only way to neutralize radioactivity, to the extent that it can be done at all, is with a nuclear reactor or a powerful nuclear accelerator. Still, Patterson's company, Clean Energy Technologies, Inc., did well for a time after he appeared on ABC's "Good Morning America" in 1996 and again in 1997.

The problem is that we all want to see miracles. Perhaps scientists do more than others. Many of them were drawn to science by its promise

of miracles. Miracles do occur, more all the time, or at least scientific advances that would have seemed like miracles a few years ago. Besides, who could blame venture capitalists for investing in hydrinos when NASA scientists are investing in gravity shields?

NASA has invested about $1 million to test the 1992 claim of a Russian physicist, Eugene Podkletnov, that objects placed above a spinning superconductive disk showed a decrease in weight of about 2 percent.

Superconductors are materals, in this case a ceramic, that lose all resistance to electric currents when cooled below a critical temperature. Could the Podkletnov gravity shield be another miracle?

"Let your imagination run wild," a NASA spokesman advised in an interview this year with The Columbus Dispatch. "What could you do if you could cut gravity by 50 percent or negate gravity altogether?"

Well, for one thing, you could build a perpetual motion machine. If Robert Fludd had had had a gravity shield, he could have raised the water back to the top of the wheel with less energy than the wheel would generate. All that was missing was the shield.

It's still missing.

NASA has tested one Podkletnov shield. Researchers measured a weight change of only 2 parts per million. Any weight reduction would be a revolutionary discovery, but the researchers noted that such a minuscule effect is at the limit of their measurement accuracy.

Podkletnov was brought to the United States to see whether he could help. He said he was puzzled, that it worked for him. But maybe NASA needed a bigger disk. That's what's happening now; they are building a bigger shield.

You can view this two ways: Either you accept the First Law of Thermodynamics, in which case the fact that a gravity shield would let you build a perpetual motion machine becomes proof that such a shield is impossible, or you figure that the First Law might be wrong and begin searching for a gravity shield.

NASA scientists chose the second option. They are betting against the laws of thermodynamics. No one wins that wager.

The gravity shield motor is the simplest example of an unbalanced-wheel perpetual motion machine. There have been hundreds of attempts to build perpetual motion machines that would run off the force of gravity, relying on complicated schemes for shifting weight from one side of a wheel to the other as it turns.

But shifting the weight always costs more energy than the wheel supplies. That was the problem with Fludd's water wheel.

It's also the problem with another another class of perpetual motion

machines that supposedly extract energy from their surroundings. These usually involve a fluid that vaporizes readily at room temperature. The pressure exerted by the expanding vapor is used to drive a piston.

Such machines violate the Second Law of Thermodynamics. It also takes energy to cool the vapor back into the liquid state so it can power a second stroke of the piston. And that takes more energy than the piston can supply.

Dennis Lee was featuring such a machine two years ago when I saw his show in Hackensack, N.J. He called it the "Fisher engine" and described it as the "most important discovery in mechanical history."

Actually, it was an old idea. A remarkably similar machine was sold to the Navy in 1880 by John Gamgee, a professor who called it the "zeromotor." It didn't work then either.

Another popular notion involves devices that somehow can rearrange and condense energy from a wide area to a smaller one, where it can be put to use. This is a hugely appealing idea. After all, there's enough heat energy in the average snowbank to heat your home for quite a while; it just happens to be distributed in inconveniently tiny amounts throughout billions of snowflakes and air pockets.

Even if it could all be gathered, it would take a great deal of energy to do so -- more than you could ever extract from the snow.

Still, an ambient-heat engine recently was described in a full page ad in Physics Today, the monthly magazine of the physics community, by a company called Entropy Systems Inc. Physicists who took time to read the ad were either outraged or incapacitated with laughter.

If the authors of the ad had any intention of bamboozling readers, they chose an unlikely publication in which to make their pitch.

It never pays to underestimate the human capacity for self-deception, but at some point, those who claim to have discovered a source of free energy must begin to realize that things aren't working as they expected.

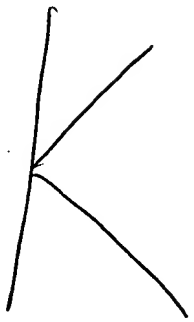
They are faced with a choice. In one direction lies acknowledgment that perhaps they've made a mistake. The more publicly and forcefully they have pressed their claim, the more difficult it will be to take that road.

In the other direction is denial. The farther they travel that road, the less likely it becomes that they will ever turn back. This is the road to fraud because no matter how many laws they've broken by that time, they cannot break the laws of physics.

Robert L. Park, professor of physics at the University of Maryland, is the author of the forthcoming book, Voodoo Science: The Road from Foolishness to Fraud (Oxford University Press).

2000 M Street, N.W. 7th Floor
Washington, D.C. 20036 3307
Tel 202.261.1000
Fax 202.887.0336

FARKAS & MANELLI PLLC
ATTORNEYS



January 19, 2001

VIA COURIER
Ms. Esther Kepplinger
Director of Group 1700
United States Patent & Trademark Office
Washington, D.C. 20231

Re: U.S. Patent Application Serial Nos.: 09/009,837; 09/008,947; 09/009,294; 09/009,455; 09/110,678; 09/111,160; 09/111,003; 09/501,622; 09/110,694; 09/110,717; 09/225,687; and 09/362,693
Inventor: Dr. Randell L. Mills
Examiners: S. Kalafut and H. Langel

Dear Ms. Kepplinger:

This letter is to advise you that Dr. Mills has arranged for a personal interview with Examiners Kalafut and Langel for February 21, 2001, 10:00 AM, to discuss outstanding Office Actions in all of the above-identified patent applications. Since all of the applications contain similar rejections under 35 U.S.C. §§ 101 and 112 based on issues relating to quantum mechanics, in particular the Schrodinger Equation, the Examiners and Dr. Mills have agreed that it would be prudent to conduct the interview simultaneously in all applications. To assist Dr. Mills in adequately preparing for this interview, we request that the Patent Office provide certain information as detailed below, which frankly should have been disclosed to Dr. Mills long ago. We also request the presence of certain Patent Office personnel, including yourself, at the February 21st interview to facilitate a prompt resolution of all outstanding issues.

As you are no doubt aware, the Patent Office's position as to the patentability of Dr. Mills' technology has changed radically over the last year. Initially, during our February 28, 2000 discussion, you stated that our '294 application was being withdrawn from allowance because Dr. Mills' technology was based on "cold fusion" and "perpetual motion." Only after Dr. Mills took this matter to a federal district court did the Patent Office abruptly alter its position. According to the March 22, 2000 Decision on Petition filed in that case, the '294 application was withdrawn because Dr. Mills' technology supposedly violated "the laws of chemistry and physics," even though no specific law of chemistry or physics was identified.

In the most recent Office Actions entered in the above-identified applications, the Patent Office once again has changed its position. The Patent Office now argues that Dr. Mills' technology cannot exist because it is not in compliance with the Schrodinger Equation, which is neither a law of physics or chemistry. In support of its new position, the Patent Office argues that "[n]ot every mathematically possible solution to the Schrodinger Equation leads to a physically meaningful description."[1] That argument, however, only begs the question: How can one know which solutions of the Schrodinger Equation represent physical reality other than by actual measurements of hydrogen atoms?

Dr. Mills has now found additional solutions to the Schrodinger Equation that represent physical reality, namely, fractional quantum number states, which are supported by actual measurements of newly-created compounds containing hydrogen atoms at these lower-energy states. Examiners Kalafut and Langel extensively studied this experimental data during six personal interviews and, based on this evidence, allowed five of the above-identified applications (now withdrawn) and issued U.S. Patent No. 6,024,935 ('935 patent). Dr. Mills intends to resubmit this substantial experimental evidence in the February 21st interview, as well as recent experimental evidence, to again establish the existence of these lower energy states to the satisfaction of the Patent Office, and thereby demonstrate the utility and enablement of his invention.

Based on the prior representations of Examiners Kalafut and Langel - - who exhaustively examined the applications and, believing that the claimed technology fully complies with Sections 101 and 112, allowed six of them - - it was readily apparent that neither Examiner of record drafted the newly-minted Section 101 and 112 rejections now pending in the above-identified applications. Recent conversations with Examiners Kalafut and Langel confirmed that belief as I became aware that the Section 101 and 112 rejections were drafted by a "secret committee" of Examiners, Supervisors and Directors established to conduct a "behind the scenes" prosecution of the above-identified applications. I further learned that this secret committee instructed Examiners Kalafut and Langel to issue the Office Actions containing the Section 101 and 112 rejections. While the Office Actions fail to identify the make-up of the committee, I am aware of at least the following committee members:

---

[1]Dr. Mills' PCT/US99/17129, International Preliminary Examination Report, Response to Applicant's Arguments Concerning the Written Opinion.

Examiner Vasudevan Salem Jagannathan
Examiner Suzi N. Tsang
Examiner Jerome Massie
Examiner Steven P. Griffin
Director Jacqueline M. Stone

Examiners Langel and Kalafut further informed me that they believe Examiner Jagannathan, a physicist, was the committee member who provided the most input on the Section 101 and 112 rejections. Upon learning this, I telephoned Examiner Jagannathan on January 16, 2001 to discuss his availability to attend the February 21st interview and to inquire as to the type of experimental evidence that would be required to satisfy him that Dr. Mills' technology is fully operable. I must say, I was stunned by Examiner Jagannathan's reaction to my call. He immediately raised his voice and in a very stern manner steadfastly refused to answer any questions or provide me with any information since, in his words, he is not the Examiner of record. Examiner Jagannathan further stated that only Examiners Langel or Kalafut could request his presence at the interview, without providing any assurance that he would comply with such a request.

It is bad enough that Examiner Jagannathan offered no explanation as to why he was not identified as an Examiner of record in this case based on the input he provided on the pending Office Actions. It only makes matters worse that he would use his non-record status as an excuse to withhold information that is vital to Dr. Mills prosecuting his applications.

Clearly, an interview with just Examiners Langel and Kalafut in attendance would be non-productive, since they both already believe that the applications fully comply with Sections 112 and 101 and, therefore, should be allowed. In essence, the Patent Office is requesting that we conduct a sham interview with what the Patent Office perceives to be "puppet" Examiners who did not even write, and disagree with, the rejections and without knowing the type of experimental evidence that would satisfy the concerns of the secret Examiners who are "pulling the strings." Dr. Mills has already submitted evidence relating to energy balances, heat and light data from working processes, and spectral data from compounds containing the lower-energy hydrogen atoms, including nuclear magnetic resonance spectroscopy, time-of-flight-secondary-ion-mass-spectroscopy, and X-ray photoelectron spectroscopy. It was precisely this evidence that convinced the Examiners of record to allow six of Dr. Mills' applications. Unfortunately, it appears that the Patent Office is not really interested in a fair and open discussion of the evidence, but rather, is seeking to "deep-six" Dr. Mills' technology along with the patent rights to which he is entitled.

The formation of a secret committee allied against Dr. Mills is just another example of the extreme lengths to which the Patent Office has gone to subvert issuance of Dr. Mills' patent applications. This latest action is consistent with the extreme positions the Patent Office has taken in litigation over the previously allowed applications that were withdrawn without the slightest review under mysterious circumstances. Indeed, Kevin Baer, the Patent Office's counsel, went so far as to argue to a federal judge that Examiners Kalafut and Langel allowed the six applications because they were "swamped" and "if they're going to approve it, they just approve it and kind of let it out the door." Attachment A. This argument not only repudiates the presumption of validity that attaches to issued patents, but further overlooks the fact that six lengthy personal interviews with Examiners Langel and Kalafut were conducted, during which extensive experimental results were discussed.

Strangely, Mr. Baer also argued that Dr. Mills is not qualified to invent the subject technology because he is a medical doctor, overlooking the fact that he is an accomplished chemist, and further that "[i]f someone actually invents this, assuming Dr. Mills has not invented this, if someone comes along and invents it in the future, they could be blocked by a valid patent [referring to Dr. Mills issued '935 patent]." Attachment B. This argument confirms Dr. Mills' strong suspicion that the Patent Office has been colluding with competitors of Dr. Mills', including Dr. Robert Park of the American Physical Society, who may be trying to appropriate Dr. Mills' technology. Dr. Mills has learned - - and the Patent Office has been made aware - - that there is a "deep throat" contact in the Patent Office with whom Dr. Park has had communications regarding Dr. Mills' pending patent applications. This fact, which was first brought to the attention of the Patent Office over four months ago during the litigation and to this day has not been denied. Attachment C.

In view of the above circumstances and in the interest of fairness, Dr. Mills requests a full written disclosure of all U.S. Patent Office personnel who took part in preparing the Section 101 and 112 rejections, as well as all U.S. Patent Office personnel who provided any input regarding the Office Actions in the above-identified applications. We request that all such persons be present at the February 21st interview. We also request that all members of the secret committee be identified and be present at the interview so that we can address any and all concerns of those who will actually decide the fate of the pending applications.

Dr. Mills has been made aware that the above-identified applications may have been reviewed by an unnamed "consultant" from the National Institutes of Science and Technology (NIST). Dr. Mills also requests full and fair written disclosure of all non-Patent Office personnel, including personnel from NIST, who were provided access to any of the above-identified applications and/or provided input on the Office Actions.

We ask that you also be present at the interview, as we would like to revisit the question of who was responsible for bringing Dr. Mills' '935 patent to the Patent Office's attention, thereby setting in motion the events that led to the withdrawal of Dr. Mills' allowed applications. You and the Patent Office have now taken three conflicting positions on this issue: (1) you stated to me on February 28, 2000 that you pulled the applications from issuance based on perceived heat - - a "fire storm" as you put it - - the Patent Office had received from an undisclosed, outside source in response to the issuance of the '935 patent, and that it was Gregory Aharonian who brought the '935 patent to the attention of the Patent Commissioner; (2) you stated in a signed affidavit filed with the D.C. District Court that your decision to withdraw the applications was not based on any "perceived heat the USPTO has received from an undisclosed, outside source," Attachment D; and (3) subsequently, the Patent Office's counsel argued during the May 22, 2000 hearing that he did not know how you became aware of the '935 patent, suggesting that a blimp could have flown over the Patent Office advising you of the '935 patent, for all it mattered, and then abruptly changed his position a short while later in a brief to the D.C. District Court stating that the press initiated the withdrawal of the applications, Attachment E. We would like to hear from you first hand, on the record, as to which individual(s) contacted you or other Patent Office personnel and instructed, or otherwise precipitated in, the withdrawal of the applications from issuance.

We believe that we are entitled to this information and that previous attempts to keep it secret - - even in response to two previous Senate inquiries - - are without basis. This information is not attorney-client privileged, nor the subject of any issue to be resolved in the pending litigation. Indeed, both the Patent Office and Dr. Mills have stipulated that information as to how the Patent Office became aware of the issued '935 patent that caused you to withdraw Dr. Mills' allowed applications from issuance is immaterial to the lawsuit. Furthermore, the Patent Office's argument that prosecution of the withdrawn applications should be separate and distinct from the lawsuit as a procedural matter, and its reopening of prosecution in these applications brings to the forefront questions regarding who instigated the taking of such actions, the real parties prosecuting the applications on behalf of the Patent Office, and the extent of any outside influences on the prosecution of these applications. This information has a direct bearing on the fair and open prosecution of these applications and, therefore, it must be disclosed.

Please also be advised, that due to the unusual actions the Patent Office has taken with respect to Dr. Mills' applications, as well as the significant impact of Dr. Mills' technology on U.S. energy policy, we intend to have one or more U.S. Senators and/or Government Officials be made of record in the applications and attend the interview to monitor the situation.

I look forward to your prompt written response to this letter.

Sincerely yours,

Jeffrey S. Melcher
Reg. No. 35,950
Customer No. 20736

CC: The Honorable Senator Max Cleland
The Honorable Senator Arlen Specter
Transition Office - Energy Department
Transition Office - Commerce Department
The Honorable Secretary Designate of Commerce - Don Evans
Examiner Vasudevan Salem Jagannathan
Director Jacqueline M. Stone
Examiner Suzi N. Tsang
Examiner Jerome Massie
Examiner Steven P. Griffin
Examiner Wayne A. Langel
Examiner Steven J. Kalafut
Dr. Randell L. Mills

109 F.Supp.2d 44
55 U.S.P.Q.2d 1812
(Cite as: 109 F.Supp.2d 44)

United States District Court,
District of Columbia.

BLACKLIGHT POWER, INC., Plaintiff,
v.
Q. Todd DICKINSON, Commissioner of Patents and Trademarks, Defendant.

Civil Action No. 00-422(EGS).

Aug. 15, 2000.

Patent applicant challenged Patent Office's decision to withdraw application after payment of issue fee. On cross-motions for summary judgment, the District Court, Sullivan, J., held that: (1) Patent Office had statutory authority to withdraw issued patent after payment of issue fee, and (2) withdrawal was not abuse of discretion.

Plaintiff's motion denied; defendant's motion granted.

West Headnotes

[1] Patents ⇐114.17
291k114.17

Patent Office's interpretation of patent issuance statute is due *Chevron* deference. 35 U.S.C.A. § 151.

[2] Patents ⇐107
291k107

Patent Office had authority, under its statutory mandate to issue only patent to which applicant is entitled, to withdraw application even after applicant has paid issue fee. 35 U.S.C.A. § 151.

[3] Patents ⇐107
291k107

Patent Office regulation authorizing withdrawal of issued patent upon determination of unpatentability was reasonable application of statutory mandate to issue only patent to which applicant was entitled. 35 U.S.C.A. § 151; 37 C.F.R. § 1.313(b).

[4] Patents ⇐112.2
291k112.2

Patent Office decision refusing to rescind notice of patent withdrawal, rather than notice of withdrawal itself, was final agency action, for purposes of judicial review.

[5] Patents ⇐107
291k107

Patent Office decision to withdraw patent application after payment of issue fee, upon determination that it raised substantial question of patentability, was not arbitrary or capricious, even though regulation allowed withdrawal only upon determination of unpatentability; Patent Office was entitled to withdraw application and return it to examiner for determination of patentability. 5 U.S.C.A. § 706(2); 37 C.F.R. § 1.313(b)(3).

Patents ⇐328(2)
291k328(2)

6,024,935. Cited.

*45 Michael H. Selter, Farkas & Manelli, P.L.L.C., Jeffrey Allan Simenauer, Washington, DC, for Plaintiff.

Fred E. Haynes, U.S. Attorney's Office, Washington, DC, Kevin Gerard Baer, Patent & Trademark Office, Office of the Solicitor, Arlington, VA, for Defendant.

MEMORANDUM OPINION AND ORDER

SULLIVAN, District Judge.

I. Introduction

Plaintiff Blacklight Power, Inc., alleges that defendant Q. Todd Dickinson, Commissioner of the Patent and Trademark Office (PTO), violated the Administrative Procedure Act (APA), 5 U.S.C. § 706 *et seq.*, when the PTO withdrew one and threatened to withdraw four others of plaintiff's patents from issue after plaintiff had received a "Notice of Allowance and Issue Fee Due" and payed the issue fee. The issues presented are whether the defendant had the authority to withdraw plaintiff's patent after plaintiff had paid the issue fee, and, if defendant did have the authority, whether that withdrawal was arbitrary and capricious. Plaintiff

claims that defendant's actions were arbitrary and capricious, and that the internal regulation on which defendant relies contravenes the governing patent statute. Pending before the Court are the parties' cross motions for summary judgment. Upon consideration of the parties' motions, memoranda in support, responses in opposition, replies in support, and the arguments at the May 22, 2000 motions hearing, plaintiff's motion for summary judgment [11-1] is **DENIED**, and defendant's motion for summary judgment [13-1] is **GRANTED.**

II. Factual Background

Plaintiff has filed a series of five patent applications for technology that, according to plaintiff, represents a new source of chemical energy from hydrogen. One of these, titled "Lower-Energy Hydrogen Methods and Structure," was filed March 21, 1997. This application was issued as U.S. Patent No. 6,024,935 (the '935 patent) on February 15, 2000. Another of these, Ser. No. 09/009,294 (the '294 application), titled "Hydride Ions," had been filed January 20, 1998. During prosecution of the '294 application, plaintiff cited over 130 prior art articles concerning "cold fusion" and "perpetual motion." When the primary patent examiner raised issues relating to the operability of the '294 technology, plaintiff conducted a personal interview with the examiner to discuss the articles *46 and the operability issues. On October 18, 1999, defendant issued a Notice of Allowance and Issue Fee Due for the '294 application (Notice). The Notice reads:

> **THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. *PROSECUTION ON THE MERITS IS CLOSED.***
>
> **THE ISSUE FEE MUST BE PAID WITHIN *THREE MONTHS* FROM THE MAILING DATE OF THIS NOTICE ... Pl.'s Mot. for Summ. J., Ex. 2.**

Plaintiff paid the issue fee three days later, October 21, 1999. *See* Pl.'s Mot. for Summ. J., Ex. 3. Following payment of the issue fee, the '294 application was set to issue as U.S. Patent No. 6,030,601 on February 29, 2000.

On February 17, 2000, twelve days before the '294 application was to issue, Frances Hicks, a Petitions Examiner with the Office of Petitions, Office of the Deputy Assistant Commissioner for Patent Policy Projects, issued a Notice (February 17 Notice) informing plaintiff that, by request of the Director of the Special Program Law Office, "the ['294] application ... is being withdrawn from issue pursuant to 37 C.F.R. § 1.313 ... to permit reopening of prosecution." Pl.'s Mot. for Summ. J., Ex. 4. It is uncontested that the '294 application file was not in defendant's possession at the time this Notice was sent.

Upon receiving the February 17 Notice, plaintiff's patent counsel began investigating the circumstances surrounding the withdrawal, contacting different PTO employees by telephone and by mail, including Ms. Hicks, and Director Esther Kepplinger. On February 28, 2000, plaintiff's patent counsel hand-delivered a final letter asking that the withdrawal be reconsidered. Director Kepplinger met with him to receive the letter. She conceded that she still did not have a copy of the '294 application, at which time plaintiff's patent counsel provided her with a copy of his own '294 application file. *See* Pl.'s Mot. for Summ. J. at 10; Melcher Decl. ¶ 22. In that meeting, Director Kepplinger indicated that she was concerned that the '294 technology involved "cold fusion" and "perpetual motion." [FN1] She also stated that the PTO intended to withdraw from issue four others of plaintiff's patents-in- application. [FN2] *See* Verified Compl. ¶ 22.

> FN1. In plaintiff's motion for summary judgment, plaintiff details that Director Kepplinger indicated that Commissioner Dickinson had telephoned her and told her to re-evaluate the '294 application after receiving communications from undisclosed third-party sources complaining about the '935 patent. See Pl.'s Mot. for Summ. J. at 11. However, at the May 22, 2000 motions hearing, for the purposes of the summary judgment motion, plaintiff's counsel retracted its argument that the withdrawal of the '294 application was in response to pressure outside of the PTO. See May 22, 2000 Hr'g. Tr. at 52.

> FN2. The four other patent applications are: Ser. No. 09/008,947, filed January 20, 2998; Ser. No. 09/009,455, filed January 20, 1998; Ser. No. 09/009,678, filed July 7, 1998; and Ser. No. 09/111,160, filed July 7, 1998.

Pursuant to 37 C.F.R. § 1.181(a)(3), defendant treated plaintiff's February 28 letters to the Commissioner, Director Robert Spar, and Director Kepplinger, as a single petition requesting that the Commissioner exercise his supervisory authority and

reverse the PTO's withdrawal decision. In a decision issued March 22, 2000 (March 22 Decision), defendant denied plaintiff's petition, refused to rescind the February 17 Notice, and disallowed plaintiff's patent. *See* Pl.'s Mot. for Summ. J., Ex. 8. The March 22 Decision indicated that the reason behind the withdrawal of the '294 application was its similarity to the '935 patent, both of which claimed to attain energy levels below the ground state according to a "novel atomic model." *See* Pl.'s Mot. for Summ. J., Ex. 8 at 2. Both claim that the electron of a hydrogen atom can attain an energy level and orbit below the 'ground state' corresponding to a fractional quantum number. According to defendant, this assertion alarmed the Director, who had *47 examined the '935 patent, and who had learned of the '292 application, because it "did not conform to the known laws of physics and chemistry." *Id.* The March 22 Decision states that the Director "was immediately aware that any pending application embodying such a concept raise [d] a substantial question of patentability of one or more claims which would require reopening prosecution." *Id.*

III. Procedure

Plaintiff filed this lawsuit on March 1, 2000. Plaintiff's complaint consists of two counts. Count I seeks preliminary and permanent injunctive relief directing defendant to issue the five contested patents-in-application as patents. Count II seeks a declaratory judgment that defendant's withdrawal of the patent applications was arbitrary and capricious and contrary to the PTO's own regulations and to the applicable patent issue statute. Plaintiff filed its motion for a temporary restraining order and preliminary injunction on March 2, 2000. At their March 3, 2000 hearing, the parties agreed that plaintiff would withdraw its motion without prejudice, and defendant would not take any Office Action with respect to the patents-in-application. On March 8, 2000, the Court issued an order memorializing that agreement, and setting a briefing schedule. Defendant filed the administrative record on March 22, 2000. The parties filed their cross motions for summary judgment on April 4, 2000. They filed their responses in opposition on April 18, 2000. Plaintiff filed its reply in support on May 1, 2000, and defendant filed its reply in support on May 5, 2000. The Court held a motions hearing on the cross motions for summary judgment on May 22, 2000.

IV. Discussion

The Court must examine several questions to resolve the pending cross motions. First, the Court must determine whether defendant has the authority to withdraw plaintiff's patent after plaintiff has paid the issue fee. If the Court determines that the PTO did possess the requisite authority, then the Court must conclude which PTO issuance, the February 17 Notice or the March 22, 2000 Decision, constitutes final, reviewable agency action. As the last step, the Court must determine whether that final agency action was arbitrary and capricious in contravention of the APA.

A. *Whether the PTO Has the Authority To Withdraw Plaintiff's Patent After Payment of the Issue Fee*

Plaintiff argues that the PTO does not have the authority to withdraw plaintiff's patent after payment of the issue fee for three reasons: 1) because doing so violates the plain language of the statute, 2) because the PTO regulation on which defendant bases its authority violates the plain language of the statute, and 3) because case law directs defendant to issue the patent upon payment of the fee.

1. *Patent Issuance Statute:* 35 U.S.C. § 151

The parties interpret 35 U.S.C. § 151, the statute governing the issuance of patents, to support their respective positions by focusing on different sections of the statute. 35 U.S.C. § 151 provides in relevant part:

> **If it appears that applicant is entitled to a patent under the law,** a written notice of allowance of the application shall be given or mailed to the applicant. The notice shall specify a sum, constituting the issue fee or a portion thereof, which shall be paid within three months thereafter. *Upon payment of this sum the patent shall issue,* but if payment is not timely made, the application shall be regarded as abandoned. 35 U.S.C. § 151 (emphases added).

Plaintiff focuses on the italicized language directing that "[u]pon payment of [the issue fee] the patent shall issue." It is well-established that "shall" is the "language of *48 command." *Boyden v. Commissioner of Patents,* 441 F.2d 1041, 1042 n. 3

(D.C.Cir.1971), *cert. den.*, 404 U.S. 842, 92 S.Ct. 139, 30 L.Ed.2d 77 (1971). Here, it is uncontroverted that the Notice of Allowance for the '294 application stated that the application was "allowed for issuance as a patent" and that "prosecution on the merits is closed." Pl.' s Mot. for Summ. J., Ex. 2. It is also uncontroverted that plaintiff paid the appropriate fees. Accordingly, plaintiff contends that defendant's defalcation is at loggerheads with the statute's clear command.

Defendant argues that if the statute is read *in toto*, *see Dole v. United Steelworkers of America*, 494 U.S. 26, 35, 110 S.Ct. 929, 108 L.Ed.2d 23 (1990), it is clear that the withdrawal of these patent applications is within the PTO's power. Defendant notes that the entire section is premised on whether "it appears that [the] applicant is entitled to a patent under the law." Here, defendant contends, that is not so, because of plaintiff's claims of having attained an energy level and orbit below the hydrogen "ground state" corresponding to a fractional quantum number. Defendant also reminds the Court that even though the word "shall" generally is interpreted as imposing a mandatory duty, "shall" may also be interpreted differently depending on its context. *See LO Shippers Action Committee v. ICC*, 857 F.2d 802, 806 (D.C.Cir.1988). As a result, defendant contends, plaintiff's textual argument is not persuasive.

[1] The parties clash over the appropriate standard of review for the PTO's interpretation of 35 U.S.C. § 151. Plaintiff contends that, since the language of 35 U.S.C. § 151, the patent issuance statute, is unambiguous, the proper statutory construction o: § 151 is a question of law that the court decides without deference to the PTO's interpretation. In *In re Portola Packaging Inc.*, 110 F.3d 786, 788 (Fed.Cir.1997), the court held that judicial inquiry is "complete" when the terms of a statute are unambiguous. Plaintiff argues that § 151 is unambiguous because it dictates that the "patent shall issue" upon payment of the issue fee.

Defendant responds that the PTO's interpretation of 35 U.S.C. § 151 is due *Chevron* deference, and should be upheld. *See Chevron U.S.A., Inc. v. Natural Resources Defense Council, Inc.*, 467 U.S. 837, 842-44, 104 S.Ct. 2778, 81 L.Ed.2d 694 (1984). "When faced with a problem of statutory construction, [the reviewing court should] show[ ] great deference to the interpretation given the statute by the officers or agency charged with its administration." *Udall v. Tallman*, 380 U.S. 1, 16, 85 S.Ct. 792, 13 L.Ed.2d 616 (1965). The PTO Director is charged with administering 35 U.S.C. § 151. Accordingly, defendant maintains, the Court should grant defendant's interpretation considerable deference. For additional support, defendant cites *Harley v. Lehman*, 981 F.Supp. 9 (D.D.C.1997). The *Harley* court held that the PTO's interpretation of § 151 is due *Chevron* deference, and that the PTO's interpretation was reasonable in light of the agency's "duty to ensure that the patents it issues are valid." *Id.* at 11. The Court is persuaded that the holding of the *Harley* court, which applied to a situation factually and procedurally identical to the present case, applies to the present case. [FN3] Therefore, the Court will accord the PTO's interpretation of 35 U.S.C. § 151 the deference it is due under *Chevron*.

FN3. For a more in-depth discussion of Harley, see A.3., "Caselaw."

[2] Examining the parties' interpretations under the by now familiar *Chevron* two-step inquiry, this Court concludes that defendant's interpretation of the plain language 35 U.S.C. § 151 should be upheld. *See Harley*, 981 F.Supp. at 11. The code premises issuance of a patent upon payment of the issue fee "[i]f it appears that applicant is entitled to a patent under the law...." *See* 35 U.S.C. § 151. These words clearly establish the PTO's mandate *49 to issue valid patents. *See In re Etter*, 756 F.2d 852 (Fed.Cir.1985).

2. PTO's Administrative Regulation: 37 C.F.R. § 1.313(b)

[3] Plaintiff asseverates that 37 C.F.R. § 1.313(b), the PTO regulation implementing § 151, on which the PTO based withdrawal of the '294 application and its proposed withdrawal of the other four allowed applications, is invalid. Plaintiff contends that that regulation violates § 151's mandate that patents shall issue upon payment of the issue fee. 37 C.F.R. § 1.313(b) provides:

> When the issue fee has been paid, the application will not be withdrawn from issue for any reasons except:
> (1) a mistake on the part of the Office;
> (2) a violation of § 1.56 [fraud] or illegality in the

application;
(3) *unpatentability of one or more claims* ...
37 C.F.R. § 1.313(b) (emphasis added).

The gravamen of plaintiff's regulatory argument is that the issue before the Court is not whether the PTO is obligated to determine a claim's patentability, but when it must make this determination. Plaintiff argues that § 151 and its legislative history indicate that the PTO must make this determination before issuance of the notice of allowance and payment of the issue fee. [FN4]

FN4. Plaintiff compares § 151 to 35 U.S.C. § 303, the patent reexamination statute, which allows reexamination of a patent only if there is a "substantial new question of patentability." The Federal Circuit, dismissing the PTO's reliance on its Manual of Patent Examining Procedure (MPEP), held that this statute does not allow reexamination of patent claims on ground considered before the patent was issued, even though reexamination might reveal that the requirements for patentability had not been met. *In re Recreative Technologies Corp.*, 83 F.3d 1394, 1397 (Fed.Cir.1996).

Defendant counters that the PTO has long had the discretion to withdraw a patent even after payment of the issue fee on unpatentability grounds. Subsection (3) was added to 37 C.F.R. § 1.313(b) in 1982. However, even before the addition of the "unpatentability" language, the PTO had the discretion to withdraw applications from issue on the basis of "mistake on the part of the Office" or subsection (1). The mistake ground was consistently held to envelop subsequently discovered reasons undermining an application's patentability. *See, e.g., Hull v. Commissioner of Patents*, 9 D.C. (2 MacArth.) 90 (1875)(denying writ of mandamus requesting issue of withdrawn patent). Indeed, defendant argues that the Director has not only the discretion but the duty to withdraw a patent from issue if there is a question about its patentability. *See In re Alappat*, 33 F.3d 1526, 1535 (Fed.Cir.1994)(en banc)(plurality opinion) (holding that the "Commissioner has an obligation to refuse to grant a patent if he believes that doing so would be contrary to law").

As for the standard of review of the PTO's adoption of 37 C.F.R. § 1.313(b), its own regulation, plaintiff offers two arguments to support its contention that the Court's review should be more searching and less deferential. First, plaintiff argues that 37 C.F.R. § 1.313(b) does not have the force and effect of law, because the PTO does not have substantive rulemaking powers outside of its own regulations, [FN5] and so the regulations are not entitled to the Court's deference.

FN5. 35 U.S.C. § 6 empowers the Commission to "establish regulations, not inconsistent with law, for the conduct of proceedings in the Office." Accordingly, the Commissioner may issue only those regulations concerning the conduct of PTO proceedings.

Alternatively, plaintiff avers that, even if the Court were persuaded that deference is owed § 1.313(b) because it concerns patent proceedings, the regulation still cannot be "inconsistent with law," and under this standard, § 1.313(b) is invalid. Even where an agency's interpretation is entitled to deference, "the courts are the *50 final authority on the issue of statutory construction. They must reject administrative constructions, whether reached by adjudication or by rulemaking, that are inconsistent with the statutory mandate or that frustrate the policy Congress sought to implement." *FEC v. Democratic Senatorial Campaign Comm.*, 454 U.S. 27, 32, 102 S.Ct. 38, 70 L.Ed.2d 23 (1981). Here, plaintiff claims, Congress has explicitly spoken to the salient issue, and so the court "must give effect to the unambiguously expressed intent of Congress." *Brown & Williamson Tobacco Corp.*, 529 U.S. 120, 120 S.Ct. 1291, 1299, 146 L.Ed.2d 121 (2000).

Defendant maintains that *Chevron* deference is appropriate here as well, on several grounds. First, as noted above, defendant argues that this regulation is due great deference because it was propounded pursuant to a statute that the PTO Director is charged with administering. *See Udall v. Tallman*, 380 U.S. 1, 16, 85 S.Ct. 792, 13 L.Ed.2d 616 (1965). Second, defendant argues that the Court must "accord[ ] considerable weight to the prior long-standing interpretation, if reasonable, of the agency charged with administering a regulatory scheme," *see Craft Machine Works, Inc. v. United States*, 926 F.2d 1110, 1114 (Fed.Cir.1991), and that 35 U.S.C. § 151 and 37 C.F.R. § 1.313(b) have co-existed without incident under that "prior long-standing interpretation." [FN6]

FN6. The PTO has interpreted the "shall issue" language as allowing the withdrawal of a patent

after payment of the issue fee for almost a century. *See* Rules of Practice in the Patent Office § 165-55 (1888-1848); Rules of Practice of the United States Patent Office in Patent Cases § 313 (1949-1972); *and see* 37 C.F.R. § 1.313(b) (1973-1996).

This Court is persuaded by defendant's argument. According the PTO's adoption of 37 C.F.R. § 1.313(b) appropriate deference under *Chevron*, this Court holds that the PTO's regulation is eminently reasonable, in light of the PTO's purpose of issuing valid patents, and contravenes neither the spirit nor the letter of 35 U.S.C. § 151.

3. *Caselaw and Intersection between 35 U.S.C. § 151 and 37 C.F.R. § 1.313(b)*

Plaintiff cites three cases in support of its argument that, once patent fees have been paid, issuance of the patent is a required administrative formality. [FN7] In *Brenner v. Ebbert*, 398 F.2d 762 (D.C.Cir.1968), *cert. den.*, 393 U.S. 926, 89 S.Ct. 259, 21 L.Ed.2d 262 (1968), the D.C. Circuit stated that "if the issue fee is timely tendered, the patent must issue," and that issuance of the patent is "a relatively ministerial act." *Brenner*, 398 F.2d at 764. The *Brenner* plaintiffs failed to pay the issue fee within the statutory three month time period because of an error by their attorney. When plaintiffs tried to pay the fee almost seven months after it was due, defendant PTO rejected the payment. Plaintiffs tried to revive the application. The Commissioner dismissed the petition. Plaintiffs brought suit to reverse the dismissal, compel revival, acceptance of the fee, and issuance of the patent. *Id.* at 763. The court upheld the PTO's dismissal. Defendant notes that, since *Brenner* concerned the timing of payment of the issue fee, and not the PTO's authority to withdraw a patent from issue, the language on which plaintiff relies is dicta. Defendant is correct. In fact, the court expressly set aside meaningful consideration of the patent issuance language, preceding the language on which plaintiff relies with "[c]ongress established a separate statutory framework for what remains--issuance of the patent." Accordingly, the Court is not persuaded by this language.

FN7. Plaintiff also cites Judge Newman's concurring opinion in *Exxon Chem. Patents, Inc. v. Lubrizol Corp.*, 935 F.2d 1263 (Fed.Cir.1991), as persuasive authority in support. Defendant notes that this was only a concurrence, and therefore "not the law," as Judge Newman herself pointed out in *Pioneer Hi-Bred Int'l, Inc. v. J.E.M. Ag Supply, Inc.*, 200 F.3d 1374, 1378 (Fed.Cir.2000).

*51 Plaintiff also cites *United States Gypsum Co. v. Masonite Corp.*, 21 F.Supp. 551 (D.Del.1937) in support of its mandatory interpretation of the "shall issue" language. In *Gypsum*, the court held that the defendant had a legal right to pay the final patent fee. In interpreting identical "shall issue" language in an earlier version of § 151, the court stated that "the Commissioner is bound by statute to issue the patent" once the final fee has been paid. *United States Gypsum Co. v. Masonite Corp.*, 21 F.Supp. 551, 552 (D.Del.1937). Defendant discounts the *Gypsum* holding by noting that there, as in *Brenner*, the issue before the court was not whether the PTO has the authority to withdraw a patent application from issue after payment of the issue fee; it was whether the district court should enjoin a patent applicant from paying the issue fee on its allowed application. Accordingly, defendant argues, and the Court agrees, this holding has no relevance to the present case. As with *Brenner*, the Court places no reliance on the language plaintiff cites.

Finally, plaintiff cites *Sampson v. Dann*, 466 F.Supp. 965 (D.D.C.1978), which is factually analogous to the present case. In a prior lawsuit, the *Sampson* court had remanded the *Sampson* plaintiff's case to the PTO for the purpose of granting plaintiff a reissue patent. On remand, the PTO examiner completed the patent examination, the PTO sent plaintiff a notice of allowance, and plaintiff timely paid the fee. The PTO mailed plaintiff a notice scheduling the issuance of the patent. Before the patent was issued, however, a defendant in a separate patent infringement action brought by Sampson contacted the PTO to inform the PTO of prior art not considered during the review of the original application. In response, PTO officials examined the prior art, and directed that the prior art be withdrawn from issue because the prior art raised doubts about patentability. Plaintiff returned to court and argued that he was entitled to have the patent issued. The court agreed, holding that Congress' command in § 151 that " 'the patent shall issue' created an enforceable right in Sampson." *See Sampson v. Dann*, 466 F.Supp. 965, 972 (D.D.C.1978). The court also postulated that "[t]he Patent and Trademark Office's over-all effectiveness as a protector of that public interest

might well be enhanced by strict and merciful cut-off of Patent and Trademark Office consideration of an individual patent application once notice and payment have been effected, particularly one that has been so prominent and protracted as Sampson's." *Id.*

Unlike the *Brenner* and *Gypsum* courts, the *Sampson* court considered the issue presented in the present case: whether defendant has the authority to refuse to issue a patent once the issue fee has been paid. Accordingly, defendant addresses it by citing a more recent case from this court, *Harley v. Lehman*, 981 F.Supp. 9 (D.D.C.1997), which also considered the issue in the present case, but which discounts the *Sampson* case because of a subsequent change in the PTO's implementing regulations.

Harley is factually and procedurally identical to the present case. In *Harley*, plaintiff's application was allowed, plaintiff paid the issue fee, and a patent number and issue date were set. Just five days before the issue date, pursuant to 37 C.F.R. § 1.313(b)(3), the PTO withdrew the application, because a PTO director became concerned about the possible unpatentability of the application's claims. The applicant sued in district court, asserting, as Blacklight does, that the Commissioner lacked the statutory authority to withdraw the patent once the issue fee had been paid. The *Harley* court held that the PTO regulation allowing withdrawal of a patent from issue based on unpatentability was a reasonable interpretation of 35 U.S.C. § 151. The court also noted the historic coexistence of the ostensibly vying statutes as further proof that the PTO's interpretation was reasonable.

*52 The *Harley* court specifically discounted the *Sampson* case. Like Blacklight, the *Harley* plaintiff relied on *Sampson*. The *Harley* court held, however, that "[p]laintiff's reliance on *Sampson v. Dann* ... is misplaced .... [because t]he regulation at issue in this case had not yet been enacted when *Sampson* was decided." [FN8] *Harley*, 981 F.Supp. at 12 n. 3. The *Sampson* court considered the interplay between 35 U.S.C. § 151 and 37 C.F.R. § 1.313(b) before the unpatentability ground, or subsection (3), had been added to the latter provision. Accordingly, the provision allowed the PTO to withdraw the patent after payment of the issue fee only in cases of (1) a mistake on the part of the Office, and (2) a violation of § 1.56 [fraud] or illegality in the application. The *Sampson* court held that, since there was evidence of neither mistake nor fraud, the PTO was legally bound to issue plaintiff's patent. Defendant's argument on this score, therefore, is double-edged: not only is *Sampson* totally void of persuasive authority here, but *Harley* is controlling. [FN9]

FN8. When *Sampson* was decided in 1978, the PTO's regulations did not expressly allow withdrawal on the basis of unpatentability after payment of the issue fee. The regulation was amended in 1982 specifically to allow withdrawal from issue on the basis of "unpatentability of one or more claims." *See* 37 C.F.R. § 1.313(b)(3).

FN9. At the May 22, 2000 hearing, plaintiff argued that there actually is no functional difference between the *Sampson* court's consideration of the pre-subsection (3) regulation and the *Harley* court's consideration of the post-subsection (3) regulation. *See* May 22, 2000 Hr'g Tr. at 63. Plaintiff argued that, in *Harley*, the PTO indicated that they relied on the mistake exception to justify the withdrawal of the *Harley* plaintiff's patent, and that the mistake was the unpatentability of plaintiff's claim. In other words, plaintiff argues defendant slid subsection (3) unpatentability under subsection (1) exception. Therefore, both courts were actually considering the same subsection--subsection (1)--and the fact that subsection (3) had been passed is of no consequence. *Id.* The Court disagrees. The *Harley* opinion clearly indicates that subsection (3), and not subsection (1), was at issue. See Harley, 981 F.Supp. at 9, 11.

The Court finds that *Harley*, and not *Sampson*, is the more persuasive authority. First, the *Sampson* opinion, in a crucial section, includes language that effectively approvingly presages the addition of subsection (3):

> It may be that fraud by the applicant, or even good cause for the failure by the Patent and Trademark Office to discover the prior art earlier would justify a courtfashioned exception to the statutory command. For example, Patent and Trademark Office custom might have established and Congress might have accepted such an exception. But the Patent and Trademark Office has failed to offer any persuasive proof of such a custom or its acceptance by Congress. Moreover, there is a substantial difference between fraud or other questionable action by an applicant which might justify such an exception and the receipt of prior

art allegations raising routine substantive questions about patentability of a widely known invention claim which is at least ten years old. *Sampson*, 466 F.Supp. at 972-3.

Second, the Court is persuaded that the fact that the *Harley* court squarely considered subsection (3), while the *Sampson* court did not, makes *Harley* more persuasive. Accordingly, this Court finds that, under the applicable caselaw, defendant's interpretation of the governing patent issuance statutes is reasonable.

B. *Which PTO Issuance Constituted Reviewable Final Agency Action*

[4] The parties disagree over which of the February 17 Notice or the March 22 Decision constituted final, reviewable agency action under the APA. Under 5 U.S.C. § 704, "[a]gency action made reviewable by statute and final agency action for which there is no other adequate remedy in a court are subject to judicial review." For these purposes, " 'agency action' includes the whole or part of an agency rule, order, license, sanction, relief, *53 or the equivalent or denial thereof, or failure to act...." 5 U.S.C. § 551(13). The parties do not dispute whether the February 17 Notice and the March 22 Decision constitute "agency action" under the meaning of the statute; they disagree over which agency action is "final" and therefore "reviewable."

Plaintiff contends that the February 17 Notice is the final, reviewable agency action. *See* Pl.'s Mot. for Summ. J. at 31-3. Courts must interpret the "finality" element flexibly and practically. *See Abbott Laboratories v. Gardner*, 387 U.S. 136, 149, 87 S.Ct. 1507, 18 L.Ed.2d 681 (1967). Furthermore, in order to be final, the ruling must not have been issued by a subordinate official. *See Franklin v. Massachusetts*, 505 U.S. 788, 797, 112 S.Ct. 2767, 120 L.Ed.2d 636 (1992). Plaintiff argues that the February 17 Notice constitutes the PTO's final action because that Notice effectively vitiated the enforceable right to the '601 patent that arose upon plaintiff's payment of the issue fee. It was definitive action, in that plaintiff's patent counsel's efforts to reverse the Notice were unavailing. And, practically speaking, it had the very concrete effect of delaying Blacklight's planned public offering.

Plaintiff further argues that the February 17 Notice is the final agency action because the March 22 Decision is merely a post hoc, pretextual rationalization cooked up for litigation purposes. The March 22 Decision was issued after plaintiff filed its lawsuit. Plaintiff characterizes the Decision as a new record made for the reviewing court. *See Consumer Federation of America v. U.S. Department of Health and Human Services*, 83 F.3d 1497, 1506 (D.C.Cir.1996). Accordingly, plaintiff argues, the Court should not consider it the final agency action.

Defendant responds, and the Court agrees, that the March 22 Decision constitutes the "final agency action within the meaning of 5 U.S.C. § 704 for purposes of seeking judicial review." *See* Pl.'s Mot. for Summ. J., Ex. 8, n. 1.

C. *Administrative Procedure Act Claims: Whether the PTO's March 22 Decision Was Arbitrary and Capricious*

[5] Plaintiff argues, alternatively, that even if the Court is convinced that § 151 does not forbid the withdrawal of an application from issue after payment of the issue fee, the PTO's withdrawal of the patents-in-application was arbitrary and capricious in violation of the Administrative Procedure Act (APA), 5 U.S.C. § 706 *et seq.* The APA authorizes the Court to issue an injunction to "compel agency action unlawfully withheld," 5 U.S.C. § 706(1), and therefore, plaintiff contends, this Court is authorized to order the PTO to issue the 5 patent applications as patents. The APA also authorizes the Court to "hold unlawful and set aside agency action ... found to be arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law," or agency action that is "in excess of statutory jurisdiction authority, or limitations, or short of statutory right." 5 U.S.C. § 706(2)(A), (C).

Plaintiff avers that the PTO, in contravention of its own proffered justification for withdrawal of the patents-in-application, did not make the required determination of unpatentability. Here, the March 22 decision upholding the February 17 notice indicated that the PTO relied on 37 C.F.R. § 1.313(b)(3), which allows withdrawal due to the "unpatentability of one or more claims," to justify its withdrawal of the patents-in-application. Plaintiff interprets that regulation to mean that a patent can

be withdrawn only upon a finding of unpatentability, not upon a possibility of unpatentability. But, plaintiff points out, the March 22 decision indicates that the February 17 notice was issued at the PTO Director's request because she believed that Blacklight's applications "raise[d] a substantial question of patentability on one or more claims." March 22 Decision at 2. Therefore, by defendant's *54 own admission, the PTO has not made a final determination on unpatentability, and so acts in violation of its own regulations, and the APA.

Defendant responds that plaintiff makes this argument about PTO regulations without citing any authority. On the other hand, defendant's own Manual of Patent Examining Procedure (MPEP) § 1308.1 makes clear that withdrawal on the basis of unpatentability after payment of the issue fee is a 2-step process: first, "the actual withdrawal will be handled by the Office of Patent Publications and then the application will be returned to the examiner" and the unpatentable claims are rejected. Defendant further points out that this interpretation of the PTO regulation was upheld in *Harley*, in which the applicant's claims were not formally rejected until 6 months after his application had been withdrawn from issue. *Harley*, 981 F.Supp. at 12.

The Court is persuaded by the defendant's argument. The unpatentability subsection functions as a last-chance procedural measure to enable defendant to observe the PTO's central mandate of issuing viable patents. It is not a final pronouncement of unpatentability. The March 22, 2000 Decision informed plaintiff of this posture; it stated that the Director's decision to withdraw the patent from issue did not constitute either a rejection or an adverse action on the ultimate determination of unpatentability. *See* Pl.'s Mot. for Summ. J., Ex. 8 at 4. Plaintiff has remedies outside this suit and this Court. *See* May 22, 2000 Hr'g Tr. at 55-59. Those remedies undermine plaintiff's suggested interpretation of the statute. Any subsection (3) determination of unpatentability will necessarily represent only a possibility of unpatentability, since such a determination, as defendant has made abundantly clear, is not in any way a final rejection. The PTO's withdrawal of plaintiff's patent application in order to reconsider its patentability was neither arbitrary nor capricious. [FN10]

FN10. This Court is troubled by several steps in the PTO's process, however. Defendant claims that the technology of the '294 application contravenes fundamental laws of chemistry and physics, yet the application was approved by a patent examiner, never reviewed by a supervisor, and would have issued as a patent but for the PTO's eleventh hour withdrawal. Defendant conceded at the May 22, 2000 hearing that the '294 application was withdrawn just days before the issuance date without the benefit of any PTO employee's re-evaluating the file. Also, the February 17 Notice, released twelve days before the scheduled issue date, gave no reason for the withdrawal besides a cryptic citation to 37 C.F.R. § 1.313(b)(3). At the May 22, 2000 hearing, defendant represented that these are common occurrences, because of the enormous number of patent applications that need to be addressed each year, and the "tremendous pressure" placed on patent examiners to produce work. *See* May 22, 2000 Hr'g Tr., at 48. Defendant may be well-advised to examine its patent issuance process so that their normal operations are not compromised by such seemingly suspicious procedures.

V. Conclusion

For the foregoing reasons, it is hereby

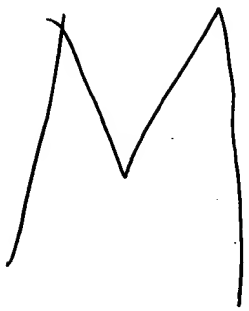
ORDERED that defendant's motion for summary judgment [13-1] is **GRANTED**; and it is

FURTHER ORDERED that plaintiff's motion for summary judgment [11-1] is **DENIED**; and it is

FURTHER ORDERED that the Clerk shall enter final judgment in favor of defendant and against plaintiff.

END OF DOCUMENT

Testing the Current



By Charles Platt

Sunday , June 25, 2000 ; X05

VOODOO SCIENCE
The Road From Foolishness to Fraud
By Robert L. Park
Oxford Univ. 230 pp. $25

For almost two decades, former physicist Robert Park has conducted a one-man search-and-destroy mission against inventors, scientists and pseudoscientists who make claims that he describes as "totally, indisputably, extravagantly wrong." As a Washington lobbyist and PR flack for the American Physical Society, Park is widely quoted whenever journalists need a rebuttal source who will scoff pithily at concepts such as magnetic healing or antigravity. He helped to establish a prestigious study panel that debunked Ronald Reagan's Star Wars Strategic Defense Initiative, and campaigned to discredit New Yorker journalist Paul Brodeur, who warned of possible health hazards caused by electromagnetic radiation from power lines. These and other battles are retold in Park's new book, Voodoo Science, which denounces the culprits he has most loved to hate over the years.

This book could have served a useful purpose. If public funds or private-investment capital really are being squandered by researchers who are self-deluded or even fraudulent, we need a thorough investigation. Alas, thoroughness is not Park's strong suit.

His primary source of information, quoted repeatedly in many of his rants, is the nightly TV news. Nothing seems to enrage him more than the sight of some upstart inventor getting air time for results that don't make sense; and Park's anger permeates his rebuttals, which border on character assassination. He contemptuously dismisses scientist James Patterson, for example, as a "caricature of an inventor" purely because of his physical appearance. There's no mention of his claim to fame as codeveloper of the fundamental laboratory technique of gas chromatography or his past consultancy work for Dow Chemical, Fairchild Semiconductor, Lockheed and the Atomic Energy Commission. Nor does Park allow Patterson any chance to explain or defend his work. In fact, none of the targets in Voodoo Science is allowed to speak for himself, apparently because Park chose not to talk to any of them.

This armchair journalism leads to some blunders. For instance, he mocks credentialed NASA scientists for investigating a gravity-shielding effect that he feels would violate a basic law of thermodynamics. If he had spoken to the researchers, they might have told him (as they told other journalists) why their theories entail no conflict with thermodynamics at all. Also, Park might have learned that the Russian emigre who prompted this work is not an obscure physicist (as he states) but a materials scientist claiming authorship of 30 papers and 10 patents.

Park's failure to gather first-hand data is unfortunate, but his selective omissions are far more serious In at least one case, he violates basic principles of journalism and science itself by apparently suppressing information that conflicts with his foregone conclusion. He dismisses the phenomenon of nuclear fusion at low temperatures as "no closer to being proven than it was the day it was announced," despite hundreds of papers, including many from scientists affiliated with respected

universities, going far beyond the controversial claims that were made for "cold fusion" in 1989. Electrochemist Michael McKubre, at SRI International, confirms that he has submitted his papers to Park, who also attended a conference last year including presentations on this topic. Park chooses to mention none of this.

Such tactics are reminiscent of the behavior of a zealous DA who is so convinced that a suspect is guilty that he feels entitled to withhold some information from the jury. Since Park also "convicts" his suspects almost entirely by paraphrasing them in his own words, Voodoo Science is not the fair trial we might have hoped for.

This is unfortunate, because many of Park's targets have indeed made implausible claims, and may be guilty as charged. To be sure of this, however, we need a fairly argued refutation, not a perfunctory dismissal. The dividing line between valid data and artifacts is not always clear; the phenomenon of superconductivity, for instance, remained inexplicable for 42 years, as Park himself admits.

Despite Park's absolute faith in his own judgment, any rush to judgment entails a risk of convicting innocent people, while search-and-destroy missions may tend to cause collateral damage. This is a serious matter, since even poorly documented vitriol can jeopardize a scientist's reputation and future funding if it is disseminated with the complicity of a respected organization such as the American Physical Society.

Of course, so long as Park makes no mistakes, he may argue that his targets deserve their punishment. Still, his widely published attacks create a chilling effect that can discourage even legitimate scientists from discussing controversial work. This hardly seems consistent with the spirit of genuinely free inquiry that should energize science. Likewise, Park's reliance on second-hand data, his presentation of selective evidence and his refusal to quote his opponents are habits that seem unworthy of a scientist.

Charles Platt is a senior writer for Wired magazine.

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
ASSISTANT SECRETARY AND COMMISSIONER OF
PATENTS AND TRADEMARKS
Washington, D.C. 20231

MAILED: FEB 12 2001

Paper No.:

In re Application of :
Randall L. Mills :
Serial No.'s: 09/009,837; 09/008,947; :
09/009,294; 09/110,678; 09/111,003; :
09/501,622; 09/110,694; 09/110,717; :
09/225,687; and 09/362,693 :

COMMUNICATION

This communication is in response to your letter addressed to Ms. Esther Kepplinger, dated January 19, 2001. In your letter, you state that a personal interview on the above-identified applications has been scheduled for February 21, 2001, 10:00 a.m.

Examination procedures with respect to interview practice are set forth in MPEP 713.01. The purpose of an interview on the merits is to advance the prosecution of applications through clarification, discussion and possibly resolution of the legal and technical issues raised in an Office Action. Consequently, I have arranged for the Primary Examiners and Supervisors who were directly involved in the creation of the Office actions in the pending applications, to be present at the interview. These individuals are Wayne Langel, Vasu Jagannathan, and Steve Griffin.

Issues raised in your letter which are not germane to the advancement of prosecution on the pending applications are outside the scope of an interview, and will not be addressed during that time.

It is our hope that the interview on the merits will constitute a beneficial discussion of the legal and technical positions set forth by the examiners.

Sincerely,

JMStone

Jacqueline M. Stone, Director
Director, Technology Center 1700
Chemical and Materials Engineering

RON WYDEN
OREGON

516 Hart Senate Building
Washington, DC
20510-3703
(202) 224-5244

e-mail:
senator@wyden.senate.gov

web site:
www.senate.gov/~wyden/

United States Senate
WASHINGTON, DC 20510-3703

April 5, 2000

The Honorable Q. Todd Dickinson
Commissioner of Patents and Trademarks
U.S. Department of Commerce
Washington, D.C. 20231

Re: Blacklight Power, Inc.'s Patent Application Ser. No. 09/009,294

Dear Commissioner Dickinson:

I am writing this letter on behalf of one of my constituents who is a member of the Board of Directors of Blacklight Power, Inc. It has come to my attention that the U.S. Patent & Trademark Office has withdrawn a Blacklight patent application, Ser. No. 09/009,294 ("294 application"), which was due to issue as U.S. Patent No. 6,030,601 on February 29, 2000. A copy of the February 17, 2000 Notice of withdrawal that was sent to Blacklight's counsel is attached. It is alleged by my constituent that the patent due to issue to Blacklight was withdrawn through an unusual process.

Please also find enclosed a copy of an abstract for a speech from an Official at the U.S. Department of State, Dr. Peter Zimmerman, who plans to present a paper to the American Physics Society in April. The abstract states that Dr. Zimmerman's "own Department and the Patent Office have fought back with success" against inventors of "hydrinos." According to Blacklight Power, the term "hydrinos" was coined and is used exclusively by the company.

My questions concerning this matter relate to: (1) any involvement you may have had in pulling the '294 application from issuance; (2) any *ex parte* communications that may have occurred between third parties and the Patent Office relating to Blacklight or its technology; and (3) how the State Department and the Patent Office may have "fought back with success" against Blacklight.

Committees:

Budget
Commerce, Science & Transportation
Energy & Natural Resources
Environment & Public Works
Special Committee on Aging

Oregon State Offices:

700 NE Multnomah St
Suite 450
Portland, OR 97232
(503) 326-7525

151 West 7th Ave
Suite 435
Eugene, OR 97401
(541) 431-0229

Sac Annex Building
105 Fir St
Suite 210
La Grande, OR 97850
(541) 962-7691

U.S. Courthouse
310 West 6th St
Room 118
Medford, OR 97501
(541) 858-5122

The Jamison Building
131 NW Hawthorne Ave
Suite 107
Bend, OR 97701
(541) 330-9142

707 13th St, SE
Suite 285
Salem, OR 97301
(503) 589-4555

To address these concerns, I am requesting that you provide me with the following information:

(a) A written description of your role and any relevant communications between you and other Patent Office personnel in withdrawing the '294 application from issue.

(b) Copies of any written communications between third parties and the Patent Office relating to Blacklight or its technology, including any correspondence between you or other Patent Office personnel and the State Department, including Dr. Zimmerman; and any written communications between the Patent Office and any other Federal agencies relating to Blacklight or its technology.

(c) The extent of any cooperation between Dr. Zimmerman, the U.S. State Department, and the Patent Office relating to Blacklight, its technology or the '294 application.

I look forward to your prompt response to this request. If you have any questions concerning this request, please contact Joshua Sheinkman of my staff at (202) 224-5244.

Sincerely,

Ron Wyden
United States Senator

Attachments: February 17, 2000 Notice of withdrawal
Peter D. Zimmerman, "Touching the Third Rail: Encounters with Pseudoscience and Pseudoscientists," U.S. Department of State

CC: Kevin Baer, Esq., Attorney-Advisor, U.S. Patent Office
Janie Cooksey, U.S. Department of Commerce
Mr. C. Norman Winningstad

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
ASSISTANT SECRETARY AND COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

FMH 2

Paper No.

FARKAS & MANELLI, PLLC
2000 M STREET NW
7TH FLOOR
WASHINGTON, DC 20036-3307

COPY MAILED

FEB 17 2000

SPECIAL PROGRAMS OFFICE
DAC FOR PATENTS

NOTICE

In re Application of
Randell L. Mills
Application No. 09/009,294
Filed: January 20, 1998
Attorney Docket No. 911319

The purpose of this communication is to inform you that the instant application, which has received Patent No. 6,030,601 and an issue date of February 29, 2000, is being withdrawn from issue pursuant to 37 CFR 1.313.

The application is being withdrawn to permit reopening of prosecution. This withdrawal was requested by the Director, Special Program Law Office.

The issue fee is refundable upon written request. However, if the application is again found allowable, the issue fee can be applied toward payment of the issue fee in the amount identified on the new Notice of Allowance and Issue Fee Due upon written request. This request and any balance due must be received on or before the due date noted in the new Notice of Allowance in order to prevent abandonment of the application.

This application, upon receipt in the Office of Petitions, will be forwarded to Technology Center AU 1745 for reopening of prosecution.

Telephone inquiries concerning this matter may be directed to the undersigned at (703) 305-8680.

Frances Hicks

Frances Hicks
Petitions Examiner
Office of Petitions
Office of the Deputy Assistant Commissioner
for Patent Policy and Projects

Previous abstract | Graphical version | Text version | Next abstract

Session J12 - FPS Awards Session-Business Meeting.
MIXED session, Sunday afternoon, April 30
101B, Long Beach Convention Center

[J12.001] Touching the Third Rail: Encounters with Pseudoscience and Pseudoscientists

Peter D. Zimmerman (United States Department of State, Washington, DC 20520)

Pseudoscience, and particularly "pseudophysics" is alive and thriving as we approach the turn of the millennium. Not only have many "inventors" of cold fusion spin-offs been making money from investors, but they and "inventors" of various kinds of "zero point energy" devices, perpetual motion machines, and other wonders such as "hydrinos" have found friends in the United States Senate. At least one Nobel Laureate in physics has come to their aid. The Web has been a powerful organizing force as well.

Some organizations, including my own Department and the Patent Office have fought back with success, but always at great cost in time and energy. Pseudophysicists and their friends have money, influence, and sometimes clout. They have not hesitated to use threats, personal attacks, and the full machinery by which government is made accountable to the public to strike at those who expose technical fraud. Encounters with pseudophysicists are like grabbing a hot wire: after the first contact it is hard to get free, and it can inflict serious injury. But you, and I, and all our colleagues in the APS must do what we can to ensure that U.S. policy is not manipulated by pseudoscience, to make certain that taxpayer money is not wasted on nonesense, and to restore public confidence in real science. This will take efforts at public education, work, and as I have learned in the last year not a little bit of courage. APS and FPS should be in the thick of the battle. This talk is an account of a year in the fray.

▪ Part J of program listing

OBERT G. TORRICELLI
NEW JERSEY

COMMITTEES:
GOVERNMENTAL AFFAIRS
RULES AND ADMINISTRATION
FOREIGN RELATIONS
FINANCE

United States Senate

113 DIRKSEN SENATE OFFICE BUILDING
WASHINGTON, DC 20510-3003
(202) 224-3224

ONE RIVERFRONT PLAZA
3RD FLOOR
NEWARK, NEW JERSEY 07102
(973) 624-4599

420 BENIGNO BLVD.
CORNMAN INTERSTATE BUSINESS PARK
SUITE A-1
BELLMAWR, NEW JERSEY 08031
(856) 933-3245

http://torricelli.senate.gov
Senator_Torricelli@Torricelli.Senate.Gov

July 20, 2001

Nicholas P. Godici
Acting Undersecretary of Commerce for Intellectual Property
and Acting Director of the Patent and Trademark Office
U.S. Patent and Trademark Office
Washington, D.C. 20231

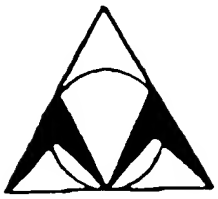
Dear Acting Director Godici:

I am writing you on behalf of Blacklight Power, Inc., one of my constituent companies. Recently, I received the attached letter from Blacklight detailing what seem to be very unusual circumstances that have arisen in the course of their attempts to obtain a patent for their new and intriguing technology. In my opinion, if the allegations set forth in this letter are indeed true, they raise troubling questions about the conduct of some representatives of the Patent Office.

I ask that you look into this matter and I look forward to receiving your response to the issues raised in the attached correspondence. Thank you for your consideration and your attention to this matter.

Sincerely,

Robert G. Torricelli
UNITED STATES SENATOR



BLACKLIGHT POWER inc.

493 Old Trenton Road
Cranbury, NJ 08512
Telephone (609) 490-1090
Fax (609) 490-1066

May 10, 2001

The Honorable Robert G. Torricelli, U.S. Senator
113 Dirksen Senate Office Building
Washington, DC 20510

Re: Investigation of Improper Actions by U.S. Patent Office

Dear Senator Torricelli:

We kindly request your assistance in investigating and addressing the highly improper actions taken by the U.S. Patent and Trademark Office (PTO) against a constituent of yours, BlackLight Power, Inc. (BlackLight). These actions not only threaten the livelihood of a thriving New Jersey company, but threaten to undermine the integrity of the U.S. patent system, as well as diminish our ability to effectively cope with the looming energy crisis in this country.

BlackLight is a small start-up company located in Cranbury, New Jersey. It employs 35 individuals, most of whom are research scientists, engineers, and technicians. For the past three years since BlackLight located its operations in New Jersey, BlackLight has worked tirelessly and has spent millions of dollars developing a new, commercially feasible, clean process for producing electricity from hydrogen. BlackLight's technology represents a significant advance in the field of energy production and the company has built a substantial business and scientific team to commercialize products. This technology is based on Dr. Randell L. Mills' theory and experimentally verified process of utilizing catalysts to relax the electron in hydrogen atoms to lower energy levels to thereby release clean energy and produce novel chemical products. Rest assured that our technology is not based on "cold fusion" or other speculative technologies.

Blacklight's new energy production process and novel chemical products are easily reproducible and have been independently verified by prestigious universities, government agencies and laboratories. Early generation power cells were confirmed by MIT Lincoln Labs, INEL, Westinghouse Corporation, NASA Lewis, Chalk River National Laboratory, Thermacore Corporation, and Pennsylvania State University. The chemical products were predicted and analyzed by 20 different types of tests performed at over 20 independent laboratories. BlackLight recently submitted 22 journal articles to journals, 16 of which are presently in press or published, which broadly disclose the test results for general peer review. The articles overwhelmingly verify BlackLight's novel hydrogen chemistry by reporting data from extreme ultraviolet (EUV) spectroscopy, plasma formation, power generation, and analysis of chemical products. BlackLight has also made 22 presentations of its results at scientific meetings over the past two years. The most recent presentation at the National Hydrogen Association, 12th Annual U.S. Hydrogen Meeting and Exposition, resulted in an invitation to submit an article to the published meeting proceedings.

Because the theory involved is revolutionary and questions the validity of basic assumptions that underlie established Quantum Mechanics, Dr. Mills' work is highly controversial. And, as always is the case in "paradigm shifting" events, both Dr. Mills and his theory have been the subjects of criticism—and even derision—by a number of established and respected sources that have acknowledged their failure to even study BlackLights' published experimental results.

The promise inherent in the ultimate commercial application of BlackLight's theory to this nation and, indeed, to all mankind is truly staggering. It represents the potential capability for mankind to harness an unlimited source of energy with vastly lower environmental impacts from harmful waste product emissions or, as with nuclear energy systems, radioactive material disposition. With the advent of this nation's ever- increasing dependency on energy from politically unstable sources overseas, rapidly escalating fuel prices, and now the prospect of rolling blackouts, such as those already occurring in California, the need for alternative low-cost, abundant sources of energy in this country has never been greater.

As an initial step in bringing its energy technology to market, BlackLight sought to protect its intellectual property rights in that technology by filing numerous patent applications in the PTO. Unfortunately, the PTO has mishandled these applications and, in so doing, has failed to carry out its Constitutional mandate to advance the progress of science.

Specifically, evidence has been uncovered regarding the PTO's improper use of outside contacts, including officials from the State Department and the American Physical Society (APS) in what appears to be a concerted effort to subvert BlackLight's technology. For instance, there is strong evidence showing that PTO officials received unidentified *ex parte* communications from competitors of BlackLight that resulted in the PTO Commissioner withdrawing from issue several BlackLight applications that had been previously allowed. [Attachment 5, February 28, 2000 and Attachment 6, January 19, 2001 letters to Director Esther Kepplinger of the PTO] Indeed, Dr. Peter Zimmerman, former Chief Scientist at the State Department, has admitted that Dr. Robert Park—spokesperson for the APS, a BlackLight competitor—uses a contact in the PTO that Dr. Park refers to as "Deep Throat" to obtain confidential information, including information relating to BlackLight's previously allowed patent applications. Following withdrawal of BlackLight's patent applications from issue, an abstract written by Dr. Zimmerman appeared on the APS' website boasting that the PTO and State Department had "fought back with success" against BlackLight. [See copy of Abstract in Attachment 6, Tab C of January 19, 2001 letter to Director Kepplinger]

Although the APS' "Deep Throat" contact has been brought to the PTO's attention on several occasions, so far, PTO officials have refused to cooperate in providing any information relating to this subject. Inasmuch as U.S. patent applications are to be held in strict confidence, obviously, any breach of that confidentiality would be deeply troubling, but particularly so if

information was being disseminated to one of BlackLight's competitors. [See copy of July 10, 2000 Letter to State Department in Attachment 6, Tab C of January 19, 2001 letter to Director Kepplinger]

The PTO has also taken extreme positions, perhaps in concert with outside competitive forces, to thwart the granting of BlackLight's patents. These actions include muzzling and essentially replacing the Examiners who had previously allowed BlackLight's patent applications with a "Secret Committee" of PTO officials assigned the task of rejecting those applications behind "closed doors." To this day, Examiner Langel, who has 28 years of experience in prosecuting patent applications, believes BlackLight's energy patent applications represent significant technological advances and therefore are allowable. Recent discussions with Examiner Langel confirm that, while he believes the experimental evidence supporting allowance of the applications submitted by BlackLight is overwhelming, he is being instructed by the Secret Committee to reject the applications despite the lack of adequate basis to do so.

Attempts by BlackLight to learn the full composition of the PTO's "Secret Committee," including the identity of outside consultants and/or competitors who may have served illegally as committee members in further breach of PTO confidentiality, have been met with only antagonism and outright aggression. Such hostility toward patent applicants is, to our knowledge, unprecedented and in clear violation of fundamental principles of due process that can only erode the trust and confidence that the public places in the PTO.

Although BlackLight has satisfied, indeed exceeded, the statutory requirements of patentability for its novel energy technology, BlackLight's counsel and company executives met with PTO officials at an interview conducted at the PTO on February 21, 2001 in an attempt to resolve this matter. Specifically, BlackLight attempted to discern through this interview the newly-minted patent standards that were being used to thwart BlackLight's applications, as well as the composition of the Secret Committee and outside consultants that were assembled to lead the PTO's attack against BlackLight.

PTO officials attending the interview flatly refused to even discuss BlackLight's request seeking the complete identity of the PTO's Secret Committee members. Indeed, Secret Committee Examiner Jagannathan, who led the interview on behalf of the PTO, became quite indignant in his response to BlackLight's inquiry, claiming that this information was not germane to the prosecution and, in a harsh tone, threatened to shut down the interview if BlackLight further inquired into the matter. Ironically, without an initial investigation conducted by BlackLight's counsel, the identity of Secret Committee Examiner Jagannathan and his own involvement in subverting BlackLight's patent applications would never have become known and he would not have been forced to attend the interview. Unfortunately, his appearance at the interview was used as yet another opportunity to "stonewall" BlackLight's attempt to obtain answers to legitimate questions. [Attachment 1, PTO mailing dated February 12, 2001 identifying certain members of Secret Committee]

The PTO also made clear during the interview that it did not feel constrained to follow established statutory standards of patentability—standards that BlackLight had already met in obtaining allowance upon the first complete examination—and that it was free to create new, more onerous standards of patentability that apply only to BlackLight. The PTO absolutely refused to provide any guidance as to the level of experimental evidence that would be required to once again convince the PTO to allow BlackLight's patent applications and even went so far as to require that BlackLight's experimental evidence be published and evaluated by its competitors before it could be considered. Surely, when enacting the patent statutes, Congress never intended that applicants' competitors oversee the granting of U.S. patents.

Unfortunately, prior attempts to investigate this matter by Senator Max Cleland have been similarly thwarted. Twice now, Senator Cleland has requested relevant information from the PTO and, in both instances, the PTO has refused to honor his request. [Attachment 2]

The first excuse the PTO gave for its refusal was that the matter was the subject of litigation between the PTO and BlackLight over the withdrawal of the allowed patent applications from issuance, presently pending before the Court of Appeals for the Federal Circuit. That excuse, however, is simply untrue since the parties stipulated in the litigation that any unidentified *ex parte* communications the PTO may have received from third parties resulting in the withdrawal of BlackLight's patent applications are not germane to whether the withdrawal itself was legal. Incredibly, the PTO has further argued that the present prosecution of BlackLight's patent applications is a proceeding separate and distinct from the litigation over the legality of withdrawing those applications from issue. And yet, when pressed a second time to provide information relating to the persons involved in the present prosecution of the subject applications, the PTO had the audacity to claim that such information was still not germane. [Attachment 3, Interview Summary] Please be assured that the limited information BlackLight seeks regarding the PTO's improper actions is not the subject of any litigation and, thus, the PTO's refusal to provide that information will not be resolved by any pending court proceeding.

Other attempts to extract this information from the PTO through official government channels have also failed. For instance, BlackLight sought to have Secretary of Commerce Donald Evans conduct an inquiry into this matter since his Department has direct jurisdiction over the administration of the PTO. Secretary Evans' office, however, declined to intervene believing that there were "no compelling reasons" to do so and merely referred the matter back to the PTO. [Attachment 4, February 14, 2001 letter from Nicholas P. Godici, Acting Under Secretary of Commerce for Intellectual Property]

The PTO's continued avoidance in dealing with this inquiry is simply unacceptable and so we are now turning to you for help. The commercial deployment of BlackLight's technology in the U.S. stands to significantly impact our country's energy policies in a very positive way and, in the process, bring notoriety to the State of New Jersey. The fair administration of the

patent examination process, which hopefully will once again lead to the granting of patents on that technology, is an important step in that direction. Critical not just to BlackLight, but to all patent applicants, is knowing that the PTO is conducting itself with the utmost integrity and candor in the examination process. One way to assure ourselves of maintaining this worthy objective would be, with your help, to initiate an investigation into the PTO's improper actions by the General Accounting Office.

Any suggestions as to other actions we might take or other assistance you can provide in resolving this unfortunate situation would be greatly appreciated. Should you require any additional information regarding this matter, please feel free to contact my counsel, Jeffrey S. Melcher (202.261.1045) or Jeffrey A. Simenauer (202.261.1001), with any questions you may have.

In addition, in view of the potential importance of BlackLight's research to the United States and its close proximity to your New Jersey offices, we would be honored if you and certain of your staff would visit the company's facility in Cranbury for a personal briefing and tour of the laboratories, and witness for yourself the performance of our demonstration devices.

Thank you for your consideration of this important matter.

Sincerely yours,

Dr. Randell L. Mills
President, BlackLight Power, Inc.

Attachments

UNITED STATES
PATENT AND
TRADEMARK OFFICE

Administrator for External Affairs
Washington, DC 20231
www.uspto.gov

The Honorable Robert G. Torricelli
United States Senate
Washington, D.C. 20510-3003

AUG 14 2001

Dear Senator Torricelli:

Thank you for your letter on behalf of Dr. Randell L. Mills, President, Blacklight Power, Inc., regarding patent application serial number 09/009,294, and the circumstances concerning its withdrawal from issuance by the United States Patent and Trademark Office (USPTO).

Dr. Mills expresses concerns of "improper" acts by the USPTO, including the possibility of inappropriate communications with outside parties, with particular regard to the withdrawal of that application from allowance. In doing so, he offers a number of allegations to support his concerns.

However, the withdrawal from issue of patent application serial number 09/009,294 is the subject of litigation in the case of *Blacklight Power, Inc. v. Dickinson*, Civ. No. 00-0422 (D.D.C.). The case is currently on appeal to the Court of Appeals of the Federal Circuit from final judgment entered in favor of the USPTO on August 15, 2000, in the district court. Although Dr. Mills states that he does not consider the information requested regarding outside contacts, among other items, to be the subject of the litigation, it is our view that these issues were raised in the ongoing litigation. It would be inappropriate, therefore, to comment on this matter in detail. Furthermore, the application is still pending and the applicant possesses all procedural remedies, including, but not limited to, the opportunity to seek judicial relief.

In light of the pending status of the relevant litigation, any additional comment by the USPTO would be inappropriate.

We trust the foregoing will be useful in responding to your constituent. For your information, a similar letter of response about this matter is also being sent to Senator Jon S. Corzine.

Sincerely,

Robert L. Stoll

Robert L. Stoll
Administrator for External Affairs

ON S. CORZINE
NEW JERSEY

COMMITTEES:
...NKING, HOUSING, AND
URBAN AFFAIRS
ENVIRONMENT AND
PUBLIC WORKS
JOINT ECONOMIC

United States Senate

WASHINGTON, DC 20510-3004

502 SENATE HART OFFICE BUILDING
WASHINGTON, DC 20510
(202) 224-4744

ONE GATEWAY CENTER
11TH FLOOR
NEWARK, NJ 07102
(973) 645-3030

208 WHITE HORSE PIKE
SUITE 18-19
BARRINGTON, NJ 08007
(856) 757-5353

August 2, 2001

The Honorable Q. Todd Dickinson
United States Department of Commerce
Patent and Trademark Office
Washington, D.C. 20231

Re: Blacklight Power, Inc.'s Patent Application
Serial# 09/009,294

Dear Commisioner:

Enclosed is correspondence I received in reference to a matter involving your agency. This is a matter of particular interest to me and I would appreciate your fair and appropriate consideration.

In your reply, please reference Blacklight Power, Inc.

If you need further information, please contact Debbie Curto, Director of Constituent Services , at (973) 645 3502.

Again, thank you for your assistance.

Sincerely,

Jon S. Corzine
United States Senator

JSC:dpc

Enclosure

May 10, 2001

The Honorable Robert G. Torricelli, U.S. Senator
115 Dirksen Senate Building
Washington, DC. 20510

Re: Investigation of Improper Actions by U.S. Patent Office

Dear Senator Torricelli:

We kindly request your assistance in investigating and addressing the highly improper actions taken by the U.S. Patent and Trademark Office (PTO) against a constituent of yours, BlackLight Power, Inc. (BlackLight). These actions not only threaten the livelihood of a thriving New Jersey company, but threaten to undermine the integrity of the U.S. patent system, as well as diminish our ability to effectively cope with the looming energy crisis in this country.

BlackLight is a small start-up company located in Cranbury, New Jersey. It employs 35 individuals, most of whom are research scientists, engineers, and technicians. For the past three years since BlackLight located its operations in New Jersey, BlackLight has worked tirelessly and has spent millions of dollars developing a new, commercially feasible, clean process for producing electricity from hydrogen. BlackLight's technology represents a significant advance in the field of energy production and the company has built a substantial business and scientific team to commercialize products. This technology is based on Dr. Randell L. Mills' theory and experimentally verified process of utilizing catalysts to relax the electron in hydrogen atoms to lower energy levels to thereby release clean energy and produce novel chemical products. Rest assured that our technology is not based on "cold fusion" or other speculative technologies.

Blacklight's new energy production process and novel chemical products are easily reproducible and have been independently verified by prestigious universities, government agencies and laboratories. Early generation power cells were confirmed by MIT Lincoln Labs, INEL, Westinghouse Corporation, NASA Lewis, Chalk River National Laboratory, Thermacore Corporation, and Pennsylvania State University. The chemical products were predicted and analyzed by 20 different types of tests performed at over 20 independent laboratories. BlackLight recently submitted 22 journal articles to journals, 16 of which are presently in press or published, which broadly disclose the test results for general peer review. The articles overwhelmingly verify BlackLight's novel hydrogen chemistry by reporting data from extreme ultraviolet (EUV) spectroscopy, plasma formation, power generation, and analysis of chemical products. BlackLight has also made 22 presentations of its results at scientific meetings over the past two years.

The most recent presentation at the National Hydrogen Association, 12th Annual U.S. Hydrogen Meeting and Exposition, resulted in an invitation to submit an article to the published meeting proceedings.

Because the theory involved is revolutionary and questions the validity of basic assumptions that underlie established Quantum Mechanics, Dr. Mills' work is highly controversial. And, as always is the case in "paradigm shifting" events, both Dr. Mills and his theory have been the subjects of criticism—and even derision—by a number of established and respected sources that have acknowledged their failure to even study BlackLights' published experimental results.

The promise inherent in the ultimate commercial application of BlackLight's theory to this nation and, indeed, to all mankind is truly staggering. It represents the potential capability for mankind to harness an unlimited source of energy with vastly lower environmental impacts from harmful waste product emissions or, as with nuclear energy systems, radioactive material disposition. With the advent of this nation's ever-increasing dependency on energy from politically unstable sources overseas, rapidly escalating fuel prices, and now the prospect of rolling blackouts, such as those already occurring in California, the need for alternative low-cost, abundant sources of energy in this country has never been greater.

As an initial step in bringing its energy technology to market, BlackLight sought to protect its intellectual property rights in that technology by filing numerous patent applications in the PTO. Unfortunately, the PTO has mishandled these applications and, in so doing, has failed to carry out its Constitutional mandate to advance the progress of science.

Specifically, evidence has been uncovered regarding the PTO's improper use of outside contacts, including officials from the State Department and the American Physical Society (APS) in what appears to be a concerted effort to subvert BlackLight's technology. For instance, there is strong evidence showing that PTO officials received unidentified *ex parte* communications from competitors of BlackLight that resulted in the PTO Commissioner withdrawing from issue several BlackLight applications that had been previously allowed. [Attachment 5, February 28, 2000 and Attachment 6, January 19, 2001 letters to Director Esther Kepplinger of the PTO] Indeed, Dr. Peter Zimmerman, former Chief Scientist at the State Department, has admitted that Dr. Robert Park—spokesperson for the APS, a BlackLight competitor—uses a contact in the PTO that Dr. Park refers to as "Deep Throat" to obtain confidential information, including information relating to BlackLight's previously allowed patent applications. Following withdrawal of BlackLight's patent applications from issue, an abstract written by Dr. Zimmerman appeared on the APS' website boasting that the PTO and State Department had "fought back with success" against BlackLight. [See copy of Abstract

in Attachment 6, Tab C of January 19, 2001 letter to Director Kepplinger].

Although the APS' "Deep Throat" contact has been brought to the PTO's attention on several occasions, so far, PTO officials have refused to cooperate in providing any information relating to this subject. Inasmuch as U.S. patent applications are to be held in strict confidence, obviously, any breach of that confidentiality would be deeply troubling, but particularly so if information was being disseminated to one of BlackLight's competitors. [See copy of July 10, 2000 Letter to State Department in Attachment 6, Tab C of January 19, 2001 letter to Director Kepplinger]

The PTO has also taken extreme positions, perhaps in concert with outside competitive forces, to thwart the granting of BlackLight's patents. These actions include muzzling and essentially replacing the Examiners who had previously allowed BlackLight's patent applications with a "Secret Committee" of PTO officials assigned the task of rejecting those applications behind "closed doors." To this day, Examiner Langel, who has 28 years of experience in prosecuting patent applications, believes BlackLight's energy patent applications represent significant technological advances and therefore are allowable. Recent discussions with Examiner Langel confirm that, while he believes the experimental evidence supporting allowance of the applications submitted by BlackLight is overwhelming, he is being instructed by the Secret Committee to reject the applications despite the lack of adequate basis to do so.

Attempts by BlackLight to learn the full composition of the PTO's "Secret Committee," including the identity of outside consultants and/or competitors who may have served illegally as committee members in further breach of PTO confidentiality, have been met with only antagonism and outright aggression. Such hostility toward patent applicants is, to our knowledge, unprecedented and in clear violation of fundamental principles of due process that can only erode the trust and confidence that the public places in the PTO.

Although BlackLight has satisfied, indeed exceeded, the statutory requirements of patentability for its novel energy technology, BlackLight's counsel and company executives met with PTO officials at an interview conducted at the PTO on February 21, 2001 in an attempt to resolve this matter. Specifically, BlackLight attempted to discern through this interview the newly-minted patent standards that were being used to thwart BlackLight's applications, as well as the composition of the Secret Committee and outside consultants that were assembled to lead the PTO's attack against BlackLight.

PTO officials attending the interview flatly refused to even discuss BlackLight's request seeking the complete identity of the PTO's Secret Committee members. Indeed, Secret Committee Examiner Jagannathan, who led the interview on behalf of the PTO, became quite indignant in his response to BlackLight's inquiry, claiming that

this information was not germane to the prosecution and, in a harsh tone, threatened to shut down the interview if BlackLight further inquired into the matter. Ironically, without an initial investigation conducted by BlackLight's counsel, the identity of Secret Committee Examiner Jagannathan and his own involvement in subverting BlackLight's patent applications would never have become known and he would not have been forced to attend the interview. Unfortunately, his appearance at the interview was used as yet another opportunity to "stonewall" BlackLight's attempt to obtain answers to legitimate questions. [Attachment 1, PTO mailing dated February 12, 2001 identifying certain members of Secret Committee]

The PTO also made clear during the interview that it did not feel constrained to follow established statutory standards of patentability—standards that BlackLight had already met in obtaining allowance upon the first complete examination—and that it was free to create new, more onerous standards of patentability that apply only to BlackLight. The PTO absolutely refused to provide any guidance as to the level of experimental evidence that would be required to once again convince the PTO to allow BlackLight's patent applications and even went so far as to require that BlackLight's experimental evidence be published and evaluated by its competitors before it could be considered. Surely, when enacting the patent statutes, Congress never intended that applicants' competitors oversee the granting of U.S. patents.

Unfortunately, prior attempts to investigate this matter by Senator Max Cleland have been similarly thwarted. Twice now, Senator Cleland has requested relevant information from the PTO and, in both instances, the PTO has refused to honor his request. [Attachment 2]

The first excuse the PTO gave for its refusal was that the matter was the subject of litigation between the PTO and BlackLight over the withdrawal of the allowed patent applications from issuance, presently pending before the Court of Appeals for the Federal Circuit. That excuse, however, is simply untrue since the parties stipulated in the litigation that any unidentified *ex parte* communications the PTO may have received from third-parties resulting in the withdrawal of BlackLight's patent applications are not germane to whether the withdrawal itself was legal. Incredibly, the PTO has further argued that the present prosecution of BlackLight's patent applications is a proceeding separate and distinct from the litigation over the legality of withdrawing those applications from issue. And yet, when pressed a second time to provide information relating to the persons involved in the present prosecution of the subject applications, the PTO had the audacity to claim that such information was still not germane. [Attachment 3, Interview Summary] Please be assured that the limited information BlackLight seeks regarding the PTO's improper actions is not the subject of any litigation and, thus, the PTO's refusal to provide that information will not be resolved by any pending court proceeding.

Other attempts to extract this information from the PTO through official government channels have also failed. For instance, BlackLight sought to have Secretary of Commerce Donald Evans conduct an inquiry into this matter since his Department has direct jurisdiction over the administration of the PTO. Secretary Evans' office, however, declined to intervene believing that there were "no compelling reasons" to do so and merely referred the matter back to the PTO. [Attachment 4, February 14, 2001 letter from Nicholas P. Godici, Acting Under Secretary of Commerce for Intellectual Property]

The PTO's continued avoidance in dealing with this inquiry is simply unacceptable and so we are now turning to you for help. The commercial deployment of BlackLight's technology in the U.S. stands to significantly impact our country's energy policies in a very positive way and, in the process, bring notoriety to the State of New Jersey. The fair administration of the patent examination process, which hopefully will once again lead to the granting of patents on that technology, is an important step in that direction. Critical not just to BlackLight, but to all patent applicants, is knowing that the PTO is conducting itself with the utmost integrity and candor in the examination process. One way to assure ourselves of maintaining this worthy objective would be, with your help, to initiate an investigation into the PTO's improper actions by the General Accounting Office.

Any suggestions as to other actions we might take or other assistance you can provide in resolving this unfortunate situation would be greatly appreciated. Should you require any additional information regarding this matter, please feel free to contact my counsel, Jeffrey S. Melcher (202.261.1045) or Jeffrey A. Simenauer (202.261.1001), with any questions you may have.

In addition, in view of the potential importance of BlackLight's research to the United States and its close proximity to your New Jersey offices, we would be honored if you and certain of your staff would visit the company's facility in Cranbury for a personal briefing and tour of the laboratories, and witness for yourself the performance of our demonstration devices.

Thank you for your consideration of this important matter.

Sincerely yours,

Dr. Randell L. Mills
President, BlackLight Power, Inc.

Attachments

UNITED STATES
PATENT AND
TRADEMARK OFFICE

Administrator for External Affairs
Washington, DC 20231
www.uspto.gov

The Honorable Jon S. Corzine
United States Senate
One Gateway Center, 11th Floor
Newark, NJ 07102

AUG 14 2001

Attention: Debbie Curto

Dear Senator Corzine:

Thank you for your letter on behalf of Jeffrey S. Melcher, and his client, Dr. Randell L. Mills, President, Blacklight Power, Inc., regarding patent application serial number 09/009,294, and the circumstances concerning its withdrawal from issuance by the United States Patent and Trademark Office (USPTO).

Dr. Mills expresses concerns of "improper" acts by the USPTO, including the possibility of inappropriate communications with outside parties, with particular regard to the withdrawal of that application from allowance. In doing so, he offers a number of allegations to support his concerns.

However, the withdrawal from issue of patent application serial number 09/009,294 is the subject of litigation in the case of *Blacklight Power, Inc. v. Dickinson*, Civ. No. 00-0422 (D.D.C.). The case is currently on appeal to the Court of Appeals of the Federal Circuit from final judgment entered in favor of the USPTO on August 15, 2000, in the district court. Although Dr. Mills states that he does not consider the information requested regarding outside contacts, among other items, to be the subject of the litigation, it is our view that these issues were raised in the ongoing litigation. It would be inappropriate, therefore, to comment on this matter in detail. Furthermore, the application is still pending and the applicant possesses all procedural remedies, including, but not limited to, the opportunity to seek judicial relief.

In light of the pending status of the relevant litigation, any additional comment by the USPTO would be inappropriate.

We trust the foregoing will be useful in responding to your constituent. For your information, a similar letter of response about this matter is also being sent to Senator Robert G. Torricelli.

Sincerely,

Robert L. Stoll

Robert L. Stoll
Administrator for External Affairs

MAX CLELAND
GEORGIA
Telephone: (202) 224-3521
TDD/TTY: (202) 224-3203
www.senate.gov/~cleland

COMMITTEES:
ARMED SERVICES
COMMERCE
GOVERNMENTAL AFFAIRS
SMALL BUSINESS

United States Senate

WASHINGTON, DC 20510-1005

March 24, 2000

Ms. Janie Cooksey
Congressional Liaison
U.S. Department of Commerce
Patent and Trademark Office
Washington, DC 20231

Dear Ms. Cooksey:

The information enclosed is of the utmost importance to my constituent, Mr. Eric Jansson. The information provided raises significant questions about the procedures followed by the Patent and Trademark Office in the decision to withhold issuance of several patents.

I understand, from speaking to the representative of my constituent, that the decision to withhold issuance of these patents was made in a most unconventional fashion. I would very deeply appreciate a thorough review of this situation and a complete report on the basis for the decision which was made in this case.

As you will note, my constituent has a firm belief that the technology involved in this application has a very great commercial as well as social value. I would be grateful for all that you can do to assure that this matter is promptly addressed.

Thank you for your consideration.

Most respectfully,

Max Cleland
United States Senator

MC:jhs

SUITE 1700
75 SPRING STREET, S.W.
ATLANTA, GA 30303-3309
(404) 331-4811

SUITE 101
235 ROOSEVELT AVENUE
ALBANY, GA 31701-2372
(912) 430-7798

611 TELFAIR STREET
AUGUSTA, GA 30901-2324
(706) 722-4040

SUITE 101
120 12TH STREET
COLUMBUS, GA 31902-2461
(706) 649-7705

203 MARTIN LUTHER KING JR. BLVD.
DALTON, GA 30721-3004
(706) 275-8905

SUITE 203
401 CHERRY STREET
MACON, GA 31201-3388
(912) 755-1779

SUITE A
440 MALL BOULEVARD
SAVANNAH, GA 31406-4823
(912) 352-0293

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
ASSISTANT SECRETARY AND COMMISSIONER
OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APR 21 2000

The Honorable Max Cleland
United States Senate
Washington, D.C. 20510-1005

Dear Senator Cleland:

Thank you for your recent letter concerning your constituent Eric Jansson.

The matter to which Mr. Jansson refers is currently in litigation in the case of *Blacklight Power, Inc. v. Dickinson*, Civ. No. 00-0422 (D.D.C.). It would be inappropriate, therefore, to comment in detail. Moreover, the application is still pending and the applicant possesses all procedural remedies, including, but not limited to, the opportunity to seek judicial relief.

The United States Patent and Trademark Office (USPTO) has moved for summary judgment in that litigation. Attached is a copy of the USPTO's Opposition to Plaintiff's Motion for Summary Judgment, including affidavits, recently filed in the litigation that addresses and denies the applicant's allegations concerning improper handling of the application.

I appreciate your letter and believe that the federal district court will fairly adjudicate the pending matter.

Sincerely,

Robert L. Stoll

Robert L. Stoll
Administrator for External Affairs

Enclosure

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
ASSISTANT SECRETARY AND COMMISSIONER
OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

MAY 15 2000

The Honorable Max Cleland
United States Senate
Washington, D.C. 20510-1005

Dear Senator Cleland:

Thank you for your most recent letter on behalf of a constituent, Eric Jansson, regarding on-going litigation between the United States Patent and Trademark Office (USPTO) and Blacklight Power, Inc.

Your letter indicates that your constituent is an investor in Blacklight Power. In the litigation, Blacklight Power is represented by counsel. Thus, it would be inappropriate for the USPTO to communicate directly, or indirectly through your office, with a person represented by counsel. Moreover, any discovery in this matter should be conducted by counsel under the district court's supervision and procedures. Last, Blacklight Power is also represented by counsel before the USPTO in regards to its patent application. When counsel has appeared to represent the patent applicant, the USPTO does not conduct the patent application process with multiple parties nor with persons having some fractional interest in the patent application.

We appreciate your understanding of the nature of your request and your intention not to urge disclosure that would be inappropriate. The district court has scheduled a hearing on May 16, 2000, to hear arguments on the cross-motions for summary judgment. Given the pending litigation, issues concerning this application are best left for resolution by the parties counsel and the district court.

Sincerely,

Robert L. Stoll
Administrator for External Affairs

United States Senate

WASHINGTON, DC 20510

December 20, 2001

Chairman Patrick Leahy
Senate Committee on the Judiciary
226 Dirksen Senate Office Building
Washington, D.C. 20510

Dear Chairman Leahy:

We are writing to you to bring to your attention actions taken by the United States Patent and Trademark Office (Patent Office) against BlackLight Power, Inc. In our opinion, if the allegations that are set forth in the accompanying documents are true, they raise questions about the conduct of some representatives of the Patent Office.

This issue was first brought to our attention over the last year and a half when BlackLight Power, Inc. contacted each of us regarding the Patent Office's withdrawal from issue of five BlackLight patent applications is apparently based on a revolutionary hydrogen chemistry that had been previously allowed after thorough examination. BlackLight's energy production technology is based on a novel catalytic process that releases large quantities of heat energy from hydrogen. This technology, which was invented by BlackLight's President and CEO, Dr. Randall L. Mills, and has been the subject of scientific studies conducted by over twenty independent laboratories and universities, may reduce U.S. dependence on foreign oil and eliminate environmental concerns.

We have each written to the Patent Office for information about the facts or circumstances surrounding its consideration of the issuance of an earlier application as a patent to BlackLight (the '935 patent) that led to the subsequent withdrawal of BlackLight's patent application. However, the Patent Office has denied our requests for information because of its ongoing litigation with BlackLight.

It is important that the Patent Office not only maintain the confidentiality of patent applications but also conduct itself with the utmost integrity and candor during the entire application process. Consistent with established rules and regulations it is requested that the United States Senate Committee on the Judiciary review this matter. We are enclosing background materials and other supporting documentation to assist you. Thank you for your assistance with this matter.

Sincerely,

Max Cleland
United States Senator

Ron Wyden
United States Senator

Enclosures

United States Senate

WASHINGTON, DC 20510

December 20, 2001

The Honorable Donald L. Evans
Secretary of the U.S. Department of Commerce
14th Street and Constitution Avenue, N.W.
Suite 5854
Washington, D.C. 20230

Dear Secretary Evans,

We are writing to you to bring to your attention actions taken by the United States Patent and Trademark Office (Patent Office) against BlackLight Power, Inc. In our opinions, if the allegations that are set forth in the accompanying documents are true, they raise questions about the conduct of some representatives of the Patent Office.

This issue was first brought to our attention over the last year and a half when BlackLight Power, Inc. contacted each of us regarding the Patent Office's withdrawal from issue of five BlackLight patent applications which are apparently based on a revolutionary hydrogen chemistry that had been previously allowed after thorough examination. BlackLight's energy production technology is apparently based on a novel catalytic process that releases large quantities of heat energy from hydrogen. This pioneering technology, which was invented by BlackLight's President and CEO, Dr. Randall L. Mills, and has been the subject of scientific studies conducted by over twenty independent laboratories and universities, may reduce U.S. dependence on foreign oil and eliminate environmental concerns.

We have each written to the Patent Office for information about the facts or circumstances surrounding its consideration of the issuance of an earlier application as a patent to BlackLight (the '935 patent) that led to the subsequent withdrawal of BlackLight's patent application. However, the Patent Office has denied our requests for information because of its ongoing litigation with BlackLight. We also urge that the Patent Office establish communications with BlackLight in order to expedite the resolution of this matter.

It is critically important that the Patent Office not only maintain the confidentiality of patent applications but also conduct itself with the utmost integrity and candor during the entire patent application process. It is requested that the U.S. Department of Commerce review this matter, consistent with established rules and regulations, and we are enclosing background materials and other supporting documentation to assist you. Thank you for your assistance with this matter.

Sincerely,

Max Cleland
United States Senator

Ron Wyden
United States Senator

Enclosures

United States Senate

WASHINGTON, DC 20510

December 21, 2001

The Honorable Donald L. Evans
Secretary
Department of Commerce
14th Street and Constitution Avenue, N.W.
Suite 5854
Washington, D.C. 20230

Dear Secretary Evans:

We have been contacted regarding an ongoing dispute between BlackLight Power, Inc. and the U.S. Patent and Trademark Office. We ask for your assistance in reviewing this matter.

BlackLight Power is concerned about the rejection of five patent applications it submitted to the Patent and Trademark Office. According to the company, the applications were rejected despite the fact that BlackLight followed all applicable rules and procedures and the applications were initially approved by Patent Office examiners. BlackLight believes that the rejection of its applications was groundless and that the decision-making process was not fair and impartial.

We ask that your office review this matter to ensure that BlackLight's applications were reviewed in a fair manner consistent with the review of all patent applications.

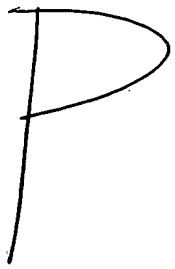
Sincerely,

JON S. CORZINE

ROBERT G. TORRICELLI

msn Hotmail® simenauerlaw@hotmail.com Inbox | Previous Page

Fr m : "Liu, Ted" <Ted.Liu@mail.house.gov>
To : "'Jeffrey Simenauer" <simenauerlaw@hotmail.com>
Subject : RE: Interview Summary
Date : Thu, 13 Feb 2003 18:05:02 -0500



just got your summary

-----Original Message-----
From: Jeffrey Simenauer [mailto:simenauerlaw@hotmail.com]
Sent: Thursday, February 13, 2003 6:05 PM
To: Liu, Ted
Subject: Interview Summary

Ted,

Thanks again for your help in investigating PTO abuses against BlackLight Power and for accompanying us to the Patent Office for the Interview on Tuesday.

As you requested, I am forwarding to you a list of bullet points that summarize the two-hour Interview. Please review them carefully when you have time. If your recollection differs from mine, or you would like to add

any other significant points, please let me know and I will make the appropriate changes.

Also, when you are satisfied with the document, please forward it to Jeffrey

Michels in Senator Wyden's office. The Senator wanted a full report on what

took place at the Interview and I think it will be an eye-opener.

Look forward to speaking with you soon, Jeff

Law Offices Of Jeffrey A. Simenauer
2000 M Street, N.W., Suite 700
Washington, D.C. 20036-3307
Tel.: (202) 261-1001
Fax: (202) 261-1002
e-mail: simenauerlaw@hotmail.com

msn Hotmail® simenauerlaw@hotmail.com Inbox | Previous Page

Fr m : "Liu, Ted" <Ted.Liu@mail.house.gov>
To : "'simenauerlaw@hotmail.com'" <simenauerlaw@hotmail.com>
Subject : summary
Date : Fri, 14 Feb 2003 11:20:09 -0500
Attachments : InterviewSummary.fin.doc (85k)

Jeff,

Here's my initial reaction to the summary. It's all good except for a small part of paragraph 3. If I see anything else I'll let you know. Thanks for putting it together so quickly.

<<InterviewSummary.fin.doc>>

SUMMARY OF DISCUSSIONS HELD AT THE U.S. PATENT OFFICE ON FEBRUARY 11, 2003 REGARDING BLACKLIGHT POWER PATENT APPLICATIONS

- The following bullet points summarize the discussions that took place on February 11, 2003, between representatives of BlackLight Power, Inc. ("BlackLight" or "BLP") and the U.S. Patent and Trademark Office ("PTO" or "Patent Office"). These discussions included a formal Interview regarding the patentability of pending BlackLight patent applications relating to novel hydrogen technology.

- Attending the Interview on behalf of BLP were the Applicant Dr. Randell L. Mills, his counsel Jeffrey S. Melcher and Jeffrey A. Simenauer, and BLP Director Dr. Shelby Brewer. Attending the Interview on behalf of the Patent Office were Quality Assurance Specialist Douglas McGinty, who lead the Interview, Primary Examiners Wayne Langel, Stephen Kalafut, and William Wayner, and Supervisory Primary Examiners Patrick Ryan and Stanley Silverman (referred to collectively as "the Examiners"). Also attending the Interview as an observer was Ted C. Liu, Senior Legislative Assistant for Congressman David Wu, who represents the 1st District of Oregon.

- Prior to the Interview, Mr. Liu spoke by telephone with Congressional Affairs Specialist Talis Dzenitis in the PTO's Legislative and International Affairs Office to discuss his reasons for attending the Interview. Mr. Liu explained to Specialist Dzenitis that a constituent associated with BLP had contacted Congressman Wu complaining of irregular procedures the PTO has been using in connection with the company's pending patent applications. The procedures complained of included the PTO's withdrawal of five applications approved by Examiners Langel and Kalafut for issuance as patents and the subsequent rejection of those and other BLP applications, and the use of a "secret commit" to determine the patentability of BLP's products. ~~Specifically, BLP representatives expressed concern over the role that certain competitors – the American Physical Society (APS) and its spokesman, Dr. Robert Park, in particular – may have had in influencing a secret PTO committee charged with evaluating and rejecting BLP's pending applications.~~ Specialist Dzenitis informed Mr. Liu that no such "secret committee" exists at the Patent Office.

- Following the formal phase of the Interview, Mr. Liu, Dr. Mills, and his counsel had extended discussions with Examiner Langel. During those discussions, Examiner Langel denied authoring the substantive Office Actions rejecting BLP's patent applications, even though those Actions bear his signature. Langel was the Examiner who, with over 28 years of experience, originally issued Notices of Allowance in three of BLP's withdrawn patent applications. During the extended discussion, he reaffirmed his view that BLP is entitled to patents on its novel hydrogen technology and that he wanted to issue those patents. Examiner Langel then explained, however, that there were other individuals with higher authority who were responsible for drafting the substantive Office Actions he signed and for ultimately deciding whether to issue BLP its patents.

- Examiner Langel reported that he did not know the identity of those individuals, except for one Examiner, Vasu Jagannathan, whom he described as someone who "had something to do with the Office Actions." That observation was confirmed in a PTO letter addressed to Applicant's counsel, dated February 12, 2001, identifying Examiner Jagannathan as someone who was "directly involved in the creation of the Office Action [filed in App'n Ser. No. 09/009294]." In view of Examiner Jagannathan's involvement, Applicant's counsel requested several times that the Examiner appear at the February 11 Interview so that any remaining concerns he may have over the patentability of

Applicant's novel hydrogen technology could be addressed. That request was denied and Examiner Jagannathan did not attend the Interview.

- Applicant and his counsel have been seeking information relating to the identify of all PTO personnel and outside parties who have reviewed, contributed, or otherwise been involved in, or consulted on, the creation of the substantive Office Actions rejecting BLP's pending patent applications. These Office Actions are exemplified by the September 1, 2000 Office Action and attached 9-page Appendix (Paper No. 27) and the July 3, 2001 Final Office Action with the 68-page "Attachment to Response to Applicants' Arguments" (Paper No. 34), both entered in U.S. Serial No. 09/009,294. The PTO has not only denied Applicant this information, but has also denied it to five current and former U.S. Senators—Ron Wyden, Gordon Smith, Jon Corzine, Robert Torricelli, and Max Cleland. Nor has the PTO provided any information relating to those individuals within and outside the Patent Office who might have played a role in the withdrawal from issue of BLP's five allowed patent applications. To avoid further confrontation, Applicant's counsel did not raise these issues at the present Interview, but are still seeking the requested information, which is germane to the prosecution of BLP's pending applications.

- Dr. Mills began the Interview with a general discussion of his novel hydrogen technology and a presentation of experimental evidence confirming its operability. Specifically, Dr. Mills explained how independent laboratory studies, including those conducted at Los Alamos and NASA, and other highly reliable scientific data demonstrated the existence of lower-energy states of hydrogen underlying his technology. During that presentation, the Examiners—with the exception of Examiner Langel—raised theoretical arguments why lower-energy hydrogen could not exist, but did not analyze or otherwise address to any significant degree the specific scientific data presented proving its existence. Instead, the Examiners raised general criticisms regarding the alleged unreliability of that data, which they believe justified according it little or no weight.

- Among the criticisms raised was Examiner Wayner's reference to other inventions that have been the subject of much ridicule, such as perpetual motion energy devices, cold fusion technology, and 100-miles-per-gallon carburetors. Examiner Wayner compared those technologies to BLP's novel hydrogen chemistry by asking the question: "How is your invention any different?" Applicant responded by pointing out the significant differences between those technologies. Unlike the nonsensical inventions mentioned by Examiner Wayner, Dr. Mills explained that he has a working prototype energy cell in operation and has actually produced novel chemical compounds based on his lower-energy hydrogen technology. Dr. Mills also has submitted a substantial body of corroborating experimental evidence that demonstrates the existence of lower energy states of hydrogen, which the PTO has to this day essentially ignored.

- Examiner Wayner then questioned why, if BLP's technology was such an important discovery, the company had not yet developed a commercial device for producing energy. Applicant noted the high costs associated with developing a commercial product and explained that BLP was looking to license patents for its technology to commercial businesses—assuming those patents are ever issued. Applicant's counsel then asked Examiner Wayner whether he was introducing a new patentability standard requiring BLP to produce a commercial device before he would allow a patent to issue. Examiner Wayner denied that was the case and, in response to a specific question from Mr. Liu, affirmed that indeed an Applicant does not need to prove commercial applicability to secure a patent for his invention.

- Examiner Wayner further questioned why BLP had so many detractors, specifically naming Dr. Robert Park, spokesman for Applicant's main competitor, the APS. Applicant was astonished by the Examiner's reference to Dr. Park, since he is the APS lobbyist Applicant has identified to the PTO as having a "Deep Throat" PTO contact with access to confidential information. Applicant's counsel tried raising the issue of Dr. Park's agenda and obvious motives for criticizing BLP's competing technology, namely that the APS lobbies Congress for, and ultimately receives, hundreds of millions of dollars in government funding for its pet projects. Specialist McGinty refused to discuss the matter and suggested that BLP has a "similar agenda," noting BLP's contract with NASA. Applicant corrected the Examiner, explaining that BLP does not receive any government funding for its research. Specialist McGinty had no response.

- Examiner Wayner then raised questions regarding the integrity of the scientific evidence presented by Dr. Mills. Included in that evidence was spectroscopic data, which counsel explained is tantamount to a "chemical fingerprint." Counsel further noted that even Dr. Robert Park—whom Examiner Wayner identified as BLP's chief antagonist—has proclaimed the reliability of spectroscopic data. Indeed, in a published article that the PTO has used to reject BLP's applications, Park had this to say about the reliability of spectral data:

  > The energy states of atoms are studied through their atomic spectra—light emitted at very specific wavelengths when electrons make a jump from one energy level to another. The exact prediction of the hydrogen spectrum was one of the first great triumphs of quantum theory; it is the platform on which our entire understanding of atomic physics is built. The theory accounts perfectly for every spectral line.
  >
  > There is no line corresponding to a "hydrino" state. Indeed there is no credible evidence at all to support Mills' claim. [*The Washington Post*, January 12, 2000]

- Yet when Dr. Mills tried to present this highly reliable data showing the spectral lines corresponding to a lower-energy hydrogen, *i.e.*, "hydrino," state, Examiner Wayner stated that "spectroscopic lines are meaningless" and "don't mean a hill of beans" to him.

- Specialist McGinty and Examiner Wayner then questioned Applicant about how one would know whether his scientific test data confirming the existence of lower energy states for hydrogen is accurate. Applicant responded by noting that the test data was conducted by highly qualified Ph.D. chemists, many of them representing independent laboratories. Applicant further noted that the data—which has cost BLP tens of millions of dollars to produce—has now been extensively peer-reviewed in over 50 published, or soon to be published, articles appearing in prestigious scientific journals. Among the journals specifically mentioned at the Interview were: *Journal of Applied Physics* and *Journal of Molecular Structure*.

- Applicant was shocked by the refusal of Specialist McGinty and Examiner Wayner to accept as reliable the scientific data appearing in these published journal articles. Applicant's counsel reminded the Examiners of a previous Interview held February 21, 2001, during which Applicant also presented experimental evidence of lower energy states of hydrogen. Counsel recalled how Examiner Jagannathan who led that Interview—but refused to show up to this one—advised Dr.

Mills that he would give serious consideration to evidence of lower-energy hydrogen only if it was submitted in articles for peer review and published in scientific journals.

- Applicant's counsel noted that, even though the PTO has never provided any legal authority for imposing a newly minted patentability standard requiring the publication of test data in peer-reviewed journal articles, Applicant nonetheless accepted Examiner Jagannathan's requirement. Counsel further noted that with now over 50 such articles—and another 30 on the way—Applicant has far exceeded the patentability standards improperly set by the Patent Office.

- Having met those inflated standards, Applicant's counsel expressed frustration that the PTO still refuses to seriously consider and analyze the scientific data published in the required journal articles. Specialist McGinty and Examiner Wayner indicated that they were not qualified to evaluate that data. When asked who was responsible for evaluating the data, Specialist McGinty stated it was the other Examiners of record, Langel and Kalafut.

- Specialist McGinty also asked what assurances Applicant could provide that the published data was actually peer reviewed. Applicant could only state what is a known fact—that to get scientific data published in a journal article, it must first go through a rigorous peer-review process.

- Applicant's counsel then raised the issue of changing standards for patentability that the PTO has continually imposed on Applicant through the examination process. For instance, Counsel specifically mentioned prior Office Actions claiming that Applicant's lower-energy hydrogen technology violates "physical laws" without identifying which such laws were supposedly being violated, and then requiring Applicant to prove otherwise. Counsel also read from a recent Office Action dismissing Applicant's scientific data out of hand for failing to prove the invalidity of quantum theory:

  > The request for reconsideration has been entered and considered but does not overcome the rejection . . . because there is no evidence presented which would prove applicant's contention that the theory of quantum mechanics is invalid." [October 7, 2002 Office Action entered in U.S. Serial No. 09/110,717]

- Counsel also mentioned that when Applicant recently submitted additional peer-reviewed journal articles offering further proof of lower-energy states of hydrogen—in accordance with the standards imposed by Examiner Jagannathan—the author(s) of a recent Office Action criticized that submission as being merely "cumulative."

- Expressing frustration over the PTO's lack of consistent patentability standards to guide Applicant, his counsel requested that Specialist McGinty provide such guidance. Specialist McGinty again raised his concern over the integrity of the experimental evidence and indicated that he would be more receptive to that evidence if it was validated by independent third parties. Applicant explained to Specialist McGinty that evidence dating back over four years includes independent third-party verification, to which the Specialist had no response. Applicant's counsel also pointed out that Specialist McGinty's unfounded concern over the lack of such verification demonstrates the PTO's obvious failure to have reviewed and analyzed the data in any detail.

- Further demonstrating this lack of familiarity with the record, Specialist McGinty criticized Applicant's experimental evidence as a whole by referring numerous times to the high-power plasma data. Applicant repeatedly pointed out to him that the plasma data was but a small fraction of the submitted data and that it was presented primarily to provide additional support for BLP's plasma-related applications. Most of the other scientific data submitted relates to a broad range of analytical studies demonstrating that lower energy states of hydrogen exist. For example, regarding those applications relating to novel chemical compounds, Applicant pointed Specialist McGinty to the extensive spectroscopic data supporting the identification of those compounds, but he apparently did not understand the significance of that data. For example, Specialist McGinty stated that the NMR data confirming lower-energy hydrogen could have been due to nitrogen. As Applicant explained, however, as a matter of basic chemistry, that NMR data only shows protons and no other element but hydrogen is in the data range.

- In response to Specialist McGinty's reservations over issuing Applicant his patents, Applicant's counsel raised questions regarding who had the ultimate authority to make that decision. Counsel expressed concern that the pending applications were being examined in secret and that without knowing who had the authority to issue the patents, Applicant was unfairly being denied the opportunity to present his case to the decision-maker. Specialist McGinty stated in no uncertain terms that Examiners Langel, Kalafut, and Wayner, as the signatories of the Office Actions, had "full authority" to prosecute the pending applications and to issue Applicant his patents. Notably, that statement contradicts Examiner Langel's comment following the Interview that other, unknown individuals have that authority, for if he did, Applicant already would have been granted his patents.

- Upon hearing Specialist McGinty's statement, Applicant's counsel immediately turned to Examiner Langel and asked him point blank whether, after studying the experimental evidence of record, he still believes that BlackLight's patent applications were allowable. The Examiner replied, "Yes, they're still allowable." Counsel then asked Examiner Langel whether, following the Interview, he was prepared to allow the claims and issue BlackLight its patents in those applications assigned to him, to which the Examiner replied, "fine with me."

- Specialist McGinty expressed immediate discomfort in agreeing to allow any claims at the Interview. Specifically, he raised a concern that even if the PTO ultimately found Applicant's claimed technology to be operable, there were still issues of novelty and nonobviousness to be addressed. Applicant's counsel expressed surprise by that statement given that the PTO has taken the position for years that Applicant's inventions are inoperable and that lower-energy hydrogen cannot possibly exist. Counsel pointed out the obvious contradiction in Specialist McGinty's statement that the PTO may now still need to conduct a search to see if lower-energy hydrogen does in fact exist.

- Applicant's counsel further recalled his own personal experience as an Examiner and the PTO's examination guidelines in effect at that time. When examining an application, the Examiner was expected to evaluate not only the operability of the claimed invention, but also, at the same time, the novelty and nonobviousness of that invention. Counsel again turned to Examiner Langel to confirm that this was his understanding. He replied that it was and, in fact, stated that the first thing he did was to conduct a thorough prior art search to see if he could "knock out" BLP's applications in the easiest way possible. Examiner Langel confirmed that he was unable to do so since the result of that

search turned up no applicable prior art, which is why he originally allowed the BLP applications assigned to him.

- Applicant's counsel acknowledged Specialist McGinty's position and tried by reassure him that they would work with him to alleviate any remaining concerns he might have in issuing BLP its patents. Counsel then specifically asked the Specialist to articulate how Applicant might accomplish that mutually beneficial goal. In response, Specialist McGinty indicated that, in the next Response to the pending Office Actions, Applicant should focus on identifying the experimental data derived by independent third party testing, as opposed to test data derived solely by Applicant.

- Specialist McGinty further expressed concern over whether such test data, even assumed to be reliable, was commensurate with the scope of the claims of the various applications to adequately support patentability. Applicant's counsel restated their belief that the test data did adequately support the claimed subject matter. Counsel, however, recommended that they go through the claims one-by-one with each of the assigned Examiners to see if some agreement can be reached as to those claims that are adequately supported and for which patents can be issued. As for the remaining claims that the PTO believes are not adequately supported by the scientific data, Applicant would not be prejudiced in continuing to seek broad claim coverage through continued prosecution. Specialist McGinty agreed that this sounded like a reasonable way to proceed. This understanding was memorialized in the Interview Summary Form as follows:

ATTACHMENT TO INTERVIEW SUMMARY FORM

Applicant requested that the following points discussed at the Interview held on February 11, 2003 be included as an Attachment to the Interview Summary Form.

Applicant's counsel and the Examiners in attendance at the Interview agreed to meet again at a future date, either in person or by telephone, to continue discussions regarding the patentability of Applicant's pending patent applications. Specifically, the Examiners expressed concern that Applicant's experimental evidence be commensurate with the scope of the claims. To address that concern, Applicant's counsel agreed with the Examiners to go through the patent applications claim-by-claim with the Examiners and demonstrate how the scientific data supports those claims.

For those claims that are supported by the data, the PTO agreed to issue those claims. For those claims that the PTO determines are not supported by the data, Applicant will continue to seek that broader claim coverage in subsequent proceedings.

APS NEWS ONLINE
August/September 2002 ISSUE

APS E-Board Passes Resolution on Perpetual Motion Machines

The APS Executive Board approved a resolution at its June 2002 meeting in Annapolis, MD, affirming the fraudulent nature of claims of perpetual motion machines.

The resolution was deemed necessary because of a recent increase in patent applications for such devices. Robert Park, APS Director of Public Information and author of the weekly electronic newsletter "What's New," reported that the US Patent Office has received several patent applications for perpetual motion machines during the first six months of this year alone. [Park's 2000 book, *Voodoo Science*, devoted considerable space to the phenomenon of such devices throughout history.] The text of the APS resolution follows.

The Executive Board of the American Physical Society is concerned that in this period of unprecedented scientific advance, misguided or fraudulent claims of perpetual motion machines and other sources of unlimited free energy are proliferating. Such devices directly violate the most fundamental laws of nature laws that have guided the scientific progress that is transforming our world.

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

BLACKLIGHT POWER, INC.	)	C.A. NO. 00-422(EGS)
	)	
VS.	)	WASHINGTON, D.C.
	)	MAY 22, 2000
Q. TODD DICKINSON	)	10:00 A.M.

TRANSCRIPT OF MOTIONS HEARING

BEFORE THE HONORABLE EMMET G. SULLIVAN

UNITED STATES DISTRICT JUDGE

APPEARANCES:

FOR THE PLAINTIFF: MICHAEL H. SELTER, ESQ.
JEFFREY A. SIMENAUER, ESQ.
JEFFREY S. MELCHER, ESQ.

FOR THE DEFENDANT: FRED E. HAYNES, ESQ.
KEVIN BAER, ESQ.

COURT REPORTER: FRANK J. RANGUS, OCR
U. S. COURTHOUSE, RM. 6822
WASHINGTON, D.C. 20001
(202) 371-0545

PROCEEDINGS RECORDED BY ELECTRONIC STENOGRAPHY; TRANSCRIPT PRODUCED BY COMPUTER.

FORM AND A PATENT COULD ISSUE WITHOUT ANY MEANINGFUL REVIEW?

MR. BAER: WELL, NO, YOUR HONOR, THERE IS REVIEW. THE PATENT EXAMINERS DO REVIEW THEM. UNFORTUNATELY, PATENT EXAMINERS ARE SWAMPED AND SOMETIMES THINGS SLIP THROUGH. IN THIS CASE, AT LEAST THE APPLICATION AT ISSUE IN THIS SUIT, IT DOESN'T APPEAR THAT THE EXAMINER DISCUSSED THE FRACTIONAL QUANTUM NUMBERS. NOW, PLAINTIFF WILL ARGUE THAT THEY DID, BUT I CAN'T FIND ANYTHING IN THE RECORD WHERE THEY DISCUSSED A FRACTIONAL END NUMBER. THAT'S THE QUANTUM NUMBER. UNFORTUNATELY, THE ONE THAT ISSUED GOT THROUGH. BUT HERE WE HAVE BEEN ABLE TO TAKE A SECOND LOOK AT IT AND WE HAVE SERIOUS QUESTIONS ABOUT THE PATENTABILITY, AND WE DON'T WANT TO ISSUE AN INVALID PATENT.

THE COURT: IF THE COURT AGREES WITH THE GOVERNMENT THAT THE PATENT SHOULD NOT ISSUE, THERE ARE ADMINISTRATIVE REMEDIES AVAILABLE TO THE PLAINTIFF?

MR. BAER: OH, ABSOLUTELY, YOUR HONOR.

THE COURT: THIS IS NOT A REJECTION. THIS IS MERELY WHAT?

MR. BAER: IT'S A PROCEDURAL TOOL TO ALLOW EXAMINATION TO CONTINUE. WHAT COULD HAPPEN, PLAINTIFF KEEPS TELLING US THAT THEY'LL COME IN THE OFFICE AND THEY'LL PROVE IT'S PATENTABLE, AND IF IT IS PATENTABLE, WE WILL ISSUE IT.

THE COURT: SO IT'S NOT AS IF THE PLAINTIFF IS OUT OF COURT?

THE COURT: THEY'RE SO NOVEL THAT THEY REQUIRE INVESTMENTS OF TIME, SIGNIFICANT INVESTMENTS OF TIME, TO DETERMINE WHETHER OR NOT THEY ARE PATENTABLE, I ASSUME.

MR. BAER: THAT IS CORRECT, YOUR HONOR.

THE COURT: WHAT HAPPENED IN THIS CASE? THIS PATENT WAS FILED A COUPLE OF YEARS AGO. IT LOOKS LIKE EVERYONE FELL ASLEEP AT THE SWITCH UNTIL AFTER ONE PATENT WAS ISSUED AND THAT TRIGGERED THIS. AFTER THE 935 PATENT WAS ISSUED, THEN THAT TRIGGERED ALL SORTS OF SCRUTINY FOR THE 294.

MR. BAER: YOUR HONOR, IT IS FILED. THE EXAMINER LOOKS AT IT. I BELIEVE THE EXAMINER ONLY HAS, IT IS LESS THAN A WEEK, AND I BELIEVE THEY HAVE TO LOOK AT TWO OR THREE APPLICATIONS A WEEK. SO VERY LITTLE TIME ACTUALLY WAS SPENT LOOKING AT THIS APPLICATION. SO THE EXAMINER ISSUED SOME OFFICE ACTIONS. IT WENT BACK AND FORTH AND EVENTUALLY HE ALLOWED IT, BUT THERE WAS NOT A TWO-YEAR INVESTIGATION OF THIS.

YOU HAD ALSO ASKED, HAD THE OFFICE RUN ANY TESTS? WE DON'T HAVE ANY ABILITY WITHIN THE AGENCY TO RUN THE TESTS. THAT'S WHY WE WANT THE APPLICANT TO COME IN. AND ONCE AGAIN I HAVE TO REMIND YOU THEY REQUESTED TO COME IN IN THEIR FORMAL LETTER TO THE AGENCY: "LET US COME IN AND TALK TO YOU ABOUT THIS BEFORE YOU DO ANYTHING." WE AGREED TO THAT. THEY'VE NOW BACKED AWAY FROM THAT.

THE COURT: WHAT'S THE PREJUDICE TO THE GOVERNMENT IF THIS PATENT ISSUES? I MEAN, THE PLAINTIFFS MAINTAIN IT WILL DO

ATTENTION TO THAT. THE PATENT NEVER ISSUED. NOW, NOT ALL OF THOSE ARE FOR THIS REASON. SOME WOULD BE FOR INTERFERENCES. SOME WOULD BE AT THE APPLICANT'S REQUEST. BUT IT'S NOT AN UNCOMMON OCCURRENCE THAT THE AGENCY, AFTER THE ISSUANCE FEE IS PAID, FINDS SOME REASON TO WITHDRAW THE PATENT.

THERE'S ALSO USUALLY A TIME LAG BETWEEN WHEN THE NOTICE OF ALLOWANCE GOES OUT AND THE ISSUE FEE IS PAID, AND IN THESE CASES THE ISSUE FEE IS PAID WITHIN DAYS. NOW, THAT'S NOT TO SAY IT NEVER HAPPENS, AND MAYBE THAT'S THIS FIRM'S PRACTICE, TO DO IT ALL THE TIME. IN MOST OF THE CASES I'VE SEEN, THERE'S ALWAYS A LONG DELAY.

THE COURT: WAS THAT A SIGNIFICANT SUM OF MONEY?

MR. BAER: I BELIEVE IT'S AROUND A THOUSAND DOLLARS.

THE COURT: A THOUSAND DOLLARS. ALL RIGHT.

MR. BAER: IT'S NOT THAT SIGNIFICANT FOR A CORPORATION.

THE COURT: IS IT SIGNIFICANT THAT, WHEN THE APPLICATION FOR THE PATENT WAS APPROVED, THERE WERE NO REASONS GIVEN? IS THAT USUAL OR NOT?

MR. BAER: THAT OFTEN HAPPENS ALSO, YOUR HONOR. THE EXAMINERS ARE UNDER TREMENDOUS PRESSURE TO PRODUCE WORK, AND IF THEY'RE GOING TO APPROVE IT, THEY JUST APPROVE IT AND KIND OF LET IT OUT THE DOOR. SOMETIMES, THEY DO PROVIDE REASONING, BUT OFTEN THEY DON'T. IT IS NOT THAT SIGNIFICANT.

YOUR HONOR, IF THE COURT DECIDES THAT THE AGENCY HAS

UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

B

BLACKLIGHT POWER, INC.,

Plaintiff,

v.

Q. TODD DICKINSON,
Commissioner of Patents,
United States Patent
& Trademark Office,

Defendant.

Civil Action No. 00-00422 EGS

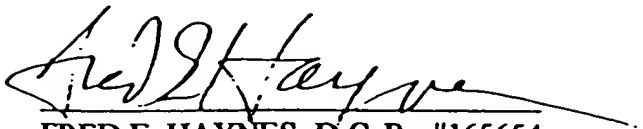
DEFENDANT'S MOTION FOR SUMMARY JUDGMENT

Pursuant to Fed. R. Civ. P. 56, defendant, by his undersigned attorneys, hereby moves this Court for an order granting summary judgment in his favor on the grounds that no genuine issue as to any material fact exists and that defendant is entitled to judgment as a matter of law. In support of this motion, the Court is referred to the accompanying memorandum of points and authorities and to the accompanying statement of material facts as to which there is no genuine issue. A draft order reflecting the requested relief is also attached.

Respectfully submitted,

WILMA A. LEWIS, D.C. Bar#358637
United States Attorney

MARK E. NAGLE, D.C.Bar #416364
Assistant United States Attorney



FRED E. HAYNES, D.C. Bar#165654
Assistant United States Attorney

OF COUNSEL:

KEVIN BAER
MARSHALL HONEYMAN
ERIC GRIMES
Associate Solicitors
Office of the Solicitor
U.S. Patent and Trademark Office
Arlington, Virginia

neither arbitrary nor capricious. Plaintiff's '294 application is based on theories that are not generally accepted by the scientific community. The determination that one or more claims may be unpatentable is reasonable in light of the extraordinary claims asserted by plaintiff. *In re Chilowsky*, 229 F.2d 457, 462 (CCPA 1956) (alleged inventions that conflict with recognized scientific principles are required to overcome presumption of inoperativeness).

Plaintiff's description of its invention as "conductive, magnetic plastics that will revolutionize circuitry and aerospace engineering" (Complaint ¶ 9), as capable of providing a small battery charged to move an automobile 1000 miles at highway speeds without the use of fossil fuels (Complaint ¶ 9), and as "revolutionary technology" (Exhibit 9 at 3) provide further support for the Director's decision to reopen prosecution to ensure that a potentially invalid patent does not issue. These alleged accomplishments are astonishing by themselves, but when coupled with a new theory of quantum mechanics that allegedly is based on a medical doctor/ inventor deriving a new atomic theory that unifies Maxwell's Equations, Newton's Laws, and Einstein's General and Special Relativity (Ex. 2 at col.4) , the combination provides ample reasor for the USPTO to review the question of patentability.

As detailed in the accompanying statement of facts, the generally accepted understanding of the hydrogen atom is that its "ground state" is its lowest energy level and that its single electron can exist only with whole integer quantum numbers. (Ex. 1 at 210-11). In contrast to the conventional understanding of quantum mechanics, plaintiff believes that it can stimulate the hydrogen atom to go below its "ground state" and that fractional quantum numbers are possible for the hydrogen atom. These assertions are not known to the Group Director charged with examining this technology as generally accepted in the scientific community. (Ex. 5 at 5-6)

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

BLACKLIGHT POWER, INC.	)	C.A. NO. 00-422(EGS)
	)	
VS.	)	WASHINGTON, D.C.
	)	MAY 22, 2000
Q. TODD DICKINSON	)	10:00 A.M.

TRANSCRIPT OF MOTIONS HEARING

BEFORE THE HONORABLE EMMET G. SULLIVAN

UNITED STATES DISTRICT JUDGE

APPEARANCES:

FOR THE PLAINTIFF: MICHAEL H. SELTER, ESQ.
JEFFREY A. SIMENAUER, ESQ.
JEFFREY S. MELCHER, ESQ.

FOR THE DEFENDANT: FRED E. HAYNES, ESQ.
KEVIN BAER, ESQ.

COURT REPORTER: FRANK J. RANGUS, OCR
U. S. COURTHOUSE, RM. 6822
WASHINGTON, D.C. 20001
(202) 371-0545

PROCEEDINGS RECORDED BY ELECTRONIC STENOGRAPHY; TRANSCRIPT PRODUCED BY COMPUTER.

WHAT THEY ARGUE IN THEIR BELIEFS IT'S CAPABLE OF DOING, THIS DISCOVERY.

MR. BAER: YOUR HONOR, BECAUSE --

THE COURT: ARE YOU ARGUING IT'S A FRAUD ON THE PUBLIC? YOU'RE NOT ARGUING THAT. YOU NEVER SAID IT WAS A FRAUD.

MR. BAER: YOUR HONOR, IT IS NOT -- WE DON'T BELIEVE IT'S A VALID (PAUSE) -- IT'S NOT PATENTABLE BECAUSE IT'S NOT VALID ACCORDING TO THE KNOWN RULES OF SCIENCE AND --

THE COURT: BUT IT'S NOT FRAUDULENT, THOUGH, IS IT?

MR. BAER: WELL (PAUSE) --

THE COURT: THAT'S NOT BEEN YOUR ARGUMENT UP TO THIS POINT.

MR. BAER: NO, I DON'T THINK I WANT TO USE THE TERM "FRAUD." DR. MILLS MAY BELIEVE HE'S INVENTED SOMETHING. WE DON'T BELIEVE HE'S DONE THAT AND WE'VE ASKED HIM TO COME IN AND PROVE THAT, AND THEY WILL HAVE AN OPPORTUNITY TO DO THAT. THE HARM IS THAT THERE IS A PRESUMPTION OF VALIDITY ATTACHED TO AN ISSUED PATENT. IT IS VERY HARD FOR A THIRD PARTY TO OVERCOME THAT. THEY CAN EXCLUDE OTHERS FROM THE MARKET. IF SOMEONE ACTUALLY INVENTS THIS, ASSUMING DR. MILLS HAS NOT INVENTED THIS, IF SOMEONE COMES ALONG AND INVENTS IT IN THE FUTURE, THEY COULD BE BLOCKED BY A VALID PATENT.

THE COURT: I SEE.

MR. BAER: SO THERE IS A HARM TO THE PUBLIC.

POSSIBLY DO THIS?" SO THERE'S AN EXAMPLE OF A THIRD PARTY CONTACTING US, AND THERE'S NOTHING SINISTER ABOUT THAT. IT'S JUST HOW THE AGENCY LEARNED ABOUT IT, AND THE REAL QUESTION WAS THE DECISION, IS THE DECISION RATIONAL?

THE COURT: WHAT ABOUT THE REAL PREJUDICE TO THE GOVERNMENT? COUNSEL MAKES A POINT. WHEN I ASKED THE QUESTION BEFORE, HE SAID, WELL, THE PREJUDICE IS IF SOMEONE PRESENTS AN IDENTICAL PATENT APPLICATION AND IS UNABLE TO PROVE PATENTABILITY, THAT PERSON WILL BE PRECLUDED FROM RECEIVING A PATENT.

MR. BAER: CORRECT. NOT ONLY RECEIVING A PATENT --

THE COURT: THE GOVERNMENT'S ARGUMENT, THOUGH, IS THAT THIS INVENTION, IF IT IS ONE, CANNOT BE PATENTED BECAUSE IT'S NOT FRAUDULENT, BUT IT'S NOT VIABLE?

MR. BAER: YOUR HONOR --

THE COURT: IT'S NOT TRUE? WHAT IS IT?

MR. BAER: -- IF THIS APPLICATION WAS THE CURE FOR CANCER BUT WE DIDN'T BELIEVE THEY HAD THE CURE FOR CANCER, BUT WE ISSUED IT ANYWAYS, WHEN SOMEONE COMES ALONG FIVE YEARS FROM NOW WITH A CURE FOR CANCER, THEY WOULD BE PRECLUDED BY THIS PATENT. PLAINTIFF COULD EXCLUDE THEM FROM THE MARKETPLACE.

THE COURT: RIGHT.

MR. BAER: YOU CAN'T PRACTICE THIS.

THE COURT: WHAT YOU'RE SAYING IS, THIS INVENTION CONTRAVENES ALL THE KNOWN LAWS OF PHYSICS AND CHEMISTRY AND IT

CAN'T, IT JUST (PAUSE) -- ARE YOU SAYING IT'S NOT TRUE? IT'S NOT VIABLE?

MR. BAER: IT IS NOT KNOWN AT THIS POINT.

THE COURT: NOT KNOWN AT THIS POINT. RIGHT.

MR. BAER: BUT THAT DOESN'T MEAN --

THE COURT: BECAUSE IT'S NOVEL.

MR. BAER: BECAUSE IT IS VERY NOVEL. IT IS EXTRAORDINARILY NOVEL, AND IT'S NOT TO SAY THAT THEY HAVE NOT INVENTED SOMETHING. MAYBE THEY HAVE, BUT IT NEEDS TO GO THROUGH FURTHER ADMINISTRATIVE REVIEW. AND IF THEY TRULY HAVEN'T DONE THIS, CREATED THIS NEW ENERGY SOURCE, BUT THEY GET A PATENT, THEY CAN PRECLUDE EVERYONE ELSE FROM EVER, FOR THE NEXT 17 YEARS AT LEAST, FROM PROSECUTING THIS INVENTION. SO WHEN SOMEONE COMES ALONG AND INVENTS THIS TEN YEARS DOWN THE ROAD, PLAINTIFF CAN SAY, "OH, YOU CAN'T DO THAT" OR "YOU HAVE TO PAY ME ROYALTIES."

THE COURT: SO THE ANSWER TO MY QUESTION IS, THE GOVERNMENT IS NOT PREJUDICED AT ALL. YOU JUST ANTICIPATE PREJUDICE TO SOMEONE ELSE IN THE FUTURE IF SOMEONE ELSE IS ABLE TO DEMONSTRATE THAT THE ENERGY SOURCE EXISTS.

MR. BAER: THE PREJUDICE WOULD ALSO BE, WE'D BE ORDERED TO ISSUE A PATENT THAT WE DO NOT BELIEVE AT THIS POINT IS PATENTABLE, AND THAT IT'S NOT A REGISTRATION SYSTEM AT THE PATENT AND TRADEMARK OFFICE. CONGRESS HAS CHARGED THE DIRECTOR WITH EXAMINING PATENT APPLICATIONS, AND THAT'S WHAT WE'RE

IN THE
UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

BLACKLIGHT POWER, INC. Plaintiff, v. Q. TODD DICKINSON, Commissioner of Patents Defendant.	)	No. 00 0422 EGS

REPLY IN SUPPORT OF
PLAINTIFF'S MOTION TO AMEND THE SCHEDULING ORDER

I. The Court Should Reject the Patent Office's Attempt To Raise Issues Outside of the Administrative Record.

Plaintiff's present Motion to Amend the Scheduling Order seeks an extension to provide the Court sufficient time to reach a decision on the merits of the parties' pending cross-motions for summary judgment and an opportunity for either party to move for a stay pending any appeal that might be taken from that decision.[1] The posture of this case awaiting summary judgment did not just happen by accident. Rather, it resulted from the parties' negotiated settlement in which BlackLight agreed to withdraw its previously-filed application for a temporary restraining order and preliminary injunction in exchange

[1] Plaintiff proposed that the stay extend ten days after any judgment to allow the losing party (whether it be Plaintiff or the Patent Office) to seek a stay pending appeal. The extra ten days was for both parties' convenience because Plaintiff believed that pending any appeal, the Patent Office would not want to be directed to issue a patent, just as Plaintiff would not want an adverse office action to issue. Thus, contrary to the Patent Office's argument (Def. Opp. 4), the extra ten days suggests nothing about Plaintiff's belief in the strength of its case.

As previously noted in Plaintiff's patent counsel's Declaration executed on April 4, 2000, Group Director Kepplinger told him that Director Dickinson directed her to review the '294 application after he received communications from undisclosed third-party sources. Exhibit 1 to Plaintiff's Motion for Summary Judgment. Although Group Director Kepplinger did not at that time disclose the third-party source, Plaintiff has done some discovery of its own and now knows why it is no coincidence that the Patent Office relied so heavily on the statements of Dr. Park, a physicist with the American Physical Society (APS), in its March 22 Decision, as this was not the first time the two have had close ties. As the Court may recall, another physicist, Dr. Peter Zimmerman, Chief Scientist for the U.S. Department of State, published an Abstract for an upcoming speech to be delivered to the APS boasting that the State Department and the Patent Office "have fought back with success" against BlackLight. Plaintiff's Reply in Support of its Motion for Summary Judgment, at 2 n.1. In an interview with Dr. Zimmerman to find out the source of those comments, he claimed to be only a "receiver" of information, not a "donor" and that it was Dr. Park who has had contact with someone in the Patent Office that Park specifically refers to as "Deep Throat." July 10, 2000, Letter to Thomas Heinemann, Esq., from Jeffrey A. Simenauer, Esq. (Exhibit 1 hereto).

While the dispute about what led to Group Director Kepplinger's review should have no bearing on the Court's decision on the pending motions for summary judgment, it does help explain why the Patent Office is now anxiously searching for some other excuse to justify its procedural missteps.

Session J12 - FPS Awards Session-Business Meeting.
MIXED session, Sunday afternoon, April 30
101B, Long Beach Convention Center

[J12.001] Touching the Third Rail: Encounters with Pseudoscience and Pseudoscientists

Peter D. Zimmerman (United States Department of State, Washington, DC 20520)

Pseudoscience, and particularly "pseudophysics" is alive and thriving as we approach the turn of the millennium. Not only have many "inventors" of cold fusion spin-offs been making money from investors, but they and "inventors" of various kinds of "zero point energy" devices, perpetual motion machines, and other wonders such as "hydrinos" have found friends in the United States Senate. At least one Nobel Laureate in physics has come to their aid. The Web has been a powerful organizing force as well.

Some organizations, including my own Department and the Patent Office have fought back with success, but always at great cost in time and energy. Pseudophysicists and their friends have money, influence, and sometimes clout. They have not hesitated to use threats, personal attacks, and the full machinery by which government is made accountable to the public to strike at those who expose technical fraud. Encounters with pseudophysicists are like grabbing a hot wire: after the first contact it is hard to get free, and it can inflict serious injury. But you, and I, and all our colleagues in the APS must do what we can to ensure that U.S. policy is not manipulated by pseudoscience, to make certain that taxpayer money is not wasted on nonesense, and to restore public confidence in real science. This will take efforts at public education, work, and as I have learned in the last year not a little bit of courage. APS and FPS should be in the thick of the battle. This talk is an account of a year in the fray.

▫ Part J of program listing

LAW OFFICES OF
JEFFREY A. SIMENAUER
2000 M STREET, N.W., SUITE 700
WASHINGTON, D.C. 20036-3307
TELEPHONE: (202) 833-0806
FACSIMILE: (202) 463-0823

July 10, 2000

VIA FACSIMILE &
U.S. MAIL

Thomas Heinemann, Esq.
Attorney Advisor
United States Department of State
Office of the Legal Advisor
2201 C Street, N.W.
Washington, DC 20520

Re: BlackLight Power, Inc.

Dear Mr. Heinemann:

This letter documents separate telephone conversations we had with you and Dr. Zimmerman last Friday, July 7, 2000.

We first telephoned you after having received the June 26, 2000 letter that you transmitted from James Thessin, Deputy Legal Advisor for the Department of State. In his letter, Mr. Thessin advises that the State Department sees no basis for liability on its part in the matter involving Dr. Peter Zimmerman referred to in our prior correspondence, dated May 12, 2000. Mr. Thessin further represents that Dr. Zimmerman did not give the speech at the APS conference and, based on what Dr. Zimmerman told him, did not contact the Patent Office regarding the intellectual property rights of BlackLight Power.

Even if it were true that Dr. Zimmerman did not himself contact the Patent Office, we have good reason to believe that he knows who did. That, together with Dr. Zimmerman's Abstract of his speech at the APS conference, which boasts that the State

Department and the Patent Office "have fought back with success" against BlackLight, certainly suggests that the State Department has played a role in this matter. The purpose of our May 12 letter was to explore the precise nature of that role and, to that end, we requested that you provide us with certain information that might lead to an amicable resolution of this matter.

Given the serious implications of Dr. Zimmerman's Abstract, and our good-faith offer to resolve this matter, we certainly expected more than the "brush off" we received from Mr. Thessin. His condescending declaration that the State Department "considers the matter to be closed," while making your position perfectly clear, simply ignores the reality and gravity of the situation and will not make it go away.

In view of that position, we specifically inquired during Friday's phone conversation with you whether anyone at the State Department was serving as counsel for Dr. Zimmerman in this matter and, if not, whether you had any objections to our contacting Dr. Zimmerman directly to confirm the statements by Mr. Thessin in his letter. You said that you had no objection to our speaking with Dr. Zimmerman since, in your words, there was no actionable matter and, therefore, no need for the State Department to provide him with counsel. When I asked you for Dr. Zimmerman's inter-office phone number where he could be reached, you said you did not have his number readily available and suggested that I retrieve it through the State Department's general information number.

Based on your response to my request to speak with Dr. Zimmerman, we immediately telephoned him to see if he would be willing to speak with us in his individual capacity in an attempt to resolve this matter amicably with him. At the very outset of our conversation, we informed Dr. Zimmerman that we had just spoken to you and that you had no objections to our calling him. We even suggested that he could check with you first before discussing the matter with us and also that he was free to consult with his own chosen representative before doing so. Dr. Zimmerman confirmed your earlier statement that he was not being represented by counsel for the State Department, or any other counsel, and we then proceeded with our conversation.

Dr. Zimmerman seemed anxious to put this matter behind him. He claimed that he was only a "receiver" of information, not a "donor," and repeated what Mr. Thessin states in his letter, namely that he did not contact anyone in the Patent Office regarding the intellectual property rights of BlackLight Power. Dr. Zimmerman also admitted that some of the information he received included e-mails from Dr. Park of the APS and that Dr. Park had told him of a contact in the Patent Office Dr. Park refers to as "Deepthroat." Unfortunately, our discussion was abruptly cut short when Dr. Zimmerman informed us that he had just received an e-mail from you advising him not to speak with us and that we would therefore have to end our conversation.

Your advice that Dr. Zimmerman cease all communications with us came somewhat as a surprise given your earlier consent to our speaking with him. In addition, your prior representations referenced in our May 12 letter that Dr. Zimmerman was acting in his individual capacity and not on behalf of the State Department regarding matters reflected in the APS Abstract would appear to be in direct conflict with your advising him on whether to communicate with us.

Be that as it may, we will certainly abide by your wishes and will have no further communications with Dr. Zimmerman on this matter until we hear from either you or him that we are again free to do so. Assuming, however, for the sake of argument only that Dr. Zimmerman was being truthful regarding his passive role in this matter, we find it incredible that you would not want to convey that information so as to put this matter behind us. Your muzzling of Dr. Zimmerman only creates a heightened suspicion that, perhaps, the State Department does indeed have something to hide and that there is a basis for liability as the APS Abstract and other evidence in our possession suggests.

Should the State Department decide to change its position and reopen this matter to consider our request for information known to be in its possession, we stand ready to take this matter up with you again. Should you decide instead to maintain your present position, giving us no choice but to secure this information through formal discovery in a legal proceeding, we are prepared to take that alternative course of action as well.

In either case, we assume you will take all necessary steps to preserve the information we are seeking, including but not limited to any e-mails or other communications Dr. Zimmerman or other State Department officials have had with Dr. Park or others regarding BlackLight's intellectual property rights. We are also particularly interested in preserving all information that may be in your possession or under your control relating to Dr. Park's "Deepthroat" contact in the Patent Office.

In the meantime, we have requested that Dr. Zimmerman, after further consultation with you and/or a chosen legal representative, advise us whether or not we can expect to continue our conversation to see if we can reach an amicable resolution of this matter, at least with respect to him in his individual capacity.

Given your instruction to Dr. Zimmerman to cease all communications with us, we kindly request that your provide a copy of this letter to him, as well Mr. Thessin. Thank you.

Sincerely,

Jeffrey A. Simenauer, Esq.
Law Offices of Jeffrey A. Simenauer
2000 M Street, 7th Floor
Washington, D.C. 20036-3307

Jeffrey S. Melcher, Esq.
Farkas & Manelli, PllC
2000 M Street, 7th Floor
Washington, D.C. 20036-3307

cc: Dr. Peter Zimmerman (via Thomas Heinemann)
Mr. James Thessin, Esq. (via Thomas Heinemann)
Ms. Jamison Borek, Esq.
Dr. Shelby Brewer

What's New
Table of Contents will help you:
Search the Archives
Subscribe or Unsubscribe
Browse previous editions of What's New.

APS Homepage

What's New

by Bob Park

The American Physical Society

Friday, 18 August 2000 Washington, DC

1. NULL HYPOTHESIS: DO ASTRONAUTS SUFFER MAGNETIC DEFICIENCY?

I must tell you, I bought a pair of Florsheim MagneForce shoes this week (WN 11 Aug 00). I have not been sick since. More on my new shoes in a later issue. Today, I want to share another Gary Null quote from the free brochure Florsheim gave me (at $125 the shoes were not free): "90-95% of health problems astronauts experienced after early space flights were eliminated when magnets were put in space suits and space capsules to counter the effects of traveling outside the earth's magnetic field." That's remarkable, since early flights never got beyond low-Earth orbit where the field is essentially unchanged. Nevertheless, we felt obliged to ask NASA. Answer: There has never been a magnet in a space suit.

2. BLACKLIGHT: SUIT AGAINST THE PATENT OFFICE FAILS.

BlackLight Power's plans to go public with an estimated $1B stock offering are presumably on hold. You may recall that on 15 Feb BLP was awarded a patent on a process for putting hydrogen atoms into a "state below the ground state," shrinking them into teeny little things called "hydrinos" (WN 18 Feb 00). A second patent dealing with hydrino chemistry was set for issuance two weeks later. But on 17 Feb the Patent Office withdrew the second patent, and opened up the first for reexamination. One patent official was concerned that the BLP technology involves perpetual motion and "cold fusion." With its intellectual property somewhere in patent purgatory, BlackLight filed suit in Federal Court against the Commissioner of Patents. Tuesday, Judge Emmet Sullivan ruled the Patent Office action was "neither arbitrary nor capricious."

IN THE
UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

D

BLACKLIGHT POWER, INC.

Plaintiff,

v.

Q. TODD DICKINSON,
Under Secretary
and Director of Patents

Defendant.

No. 00 0422 EGS

DECLARATION OF ESTHER M. KEPPLINGER

I, Esther M. Kepplinger, declare and state:

1. I am presently employed by the United States Patent and Trademark Office ("USPTO"), and at all times relevant to the matters contained in this declaration, I served as the Director for Technology Center 1700. If called as a witness, I would testify as follows:

2. On Thursday, February 24, 2000, I received a call from Jeffrey Melcher, the attorney for the applicant on application 09/009,294 ("the '294 application"). Mr. Melcher indicated that he had received a Notice dated February 17, 2000 stating that the '294 application had been withdrawn from issue. I indicated to Mr. Melcher that I was the person that was responsible for the withdrawal.

3. Four days later, Monday, February 28, 2000, Mr. Melcher came to my office. I

[redacted]

explained to Mr. Melcher that I was extremely concerned about the application because it was based on the concept of an electron going to a lower orbital in a fashion that is contrary to the known laws of physics and chemistry. I also may have said that the questionable sciences alleged in patent number 6,024,035 and the '294 application were similar to other questionable sciences such as "cold fusion" and "perpetual motion", but I did not tell Mr. Melcher that my concerns relating to the '294 application were based solely on the concepts of "cold fusion" and/or "perpetual motion." My main concern was the proposition that the applicant was claiming the electron going to a lower orbital in a fashion that I knew was contrary to the known laws of physics and chemistry.

4. Mr. Melcher then questioned me as to whether Commissioner Q. Todd Dickinson was involved in the decision to withdraw the '294 application. I specifically stated to Mr. Melcher that Commissioner Dickinson had nothing to do with the initial decision to withdraw the application. I told him that I alone made the decision to withdraw the application based on patentability concerns. At no time did I tell Mr. Melcher that Commissioner Dickinson directed me or anyone else to withdraw the application from issue.

5. I did not discuss my decision to withdraw the application with any person outside the USPTO. No one directed me to make the decision to withdraw the '294 application.

6. Contrary to Mr. Melcher's assertion, my decision was not based in whole or in part on any "perceived 'heat'" the USPTO had received from an undisclosed, outside source.

7. The decision to withdraw the application was based solely on the patentability standards contained in Title 35 of the United States Code.

8. Mr. Melcher and I discussed four other applications by the same applicant that had gone to issue. I told Mr. Melcher that I was "pulling" these applications back from their locations so that I could take a look at them. I did not tell Mr. Melcher that I was going to withdraw these cases from issue. I told him that, unlike the sense of urgency regarding the '294 application, I still

had time to obtain the other four application files for review without withdrawing them from issue. I explained that the reason I hadn't done the same with the '294 application is that it was much closer to its issue date than the other four applications.

I DECLARE UNDER PENALTY OF PERJURY UNDER THE LAWS OF THE UNITED STATES OF AMERICA THAT THE FOREGOING IS TRUE AND CORRECT.

4/14/00
Date

Esther M. Kepplinger
Esther M. Kepplinger

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

BLACKLIGHT POWER, INC.	)	C.A. NO. 00-422(EGS)
	)	
VS.	)	WASHINGTON, D.C.
	)	MAY 22, 2000
Q. TODD DICKINSON	)	10:00 A.M.

TRANSCRIPT OF MOTIONS HEARING

BEFORE THE HONORABLE EMMET G. SULLIVAN

UNITED STATES DISTRICT JUDGE

APPEARANCES:

FOR THE PLAINTIFF: MICHAEL H. SELTER, ESQ.
JEFFREY A. SIMENAUER, ESQ.
JEFFREY S. MELCHER, ESQ.

FOR THE DEFENDANT: FRED E. HAYNES, ESQ.
KEVIN BAER, ESQ.

COURT REPORTER: FRANK J. RANGUS, OCR
U. S. COURTHOUSE, RM. 6822
WASHINGTON, D.C. 20001
(202) 371-0545

PROCEEDINGS RECORDED BY ELECTRONIC STENOGRAPHY; TRANSCRIPT PRODUCED BY COMPUTER.

SOMETHING FOCUSED HER ATTENTION ON THE 935 PATENT AND THE TIMING OF THE 294 PATENT IS JUST, IT'S NOT JUST COINCIDENTAL. IT WAS ABOUT TO ISSUE.

MR. BAER: WELL, IT WAS ABOUT TO ISSUE, YOUR HONOR, BUT WHAT HAPPENED IS, I DON'T KNOW, TO ANSWER YOUR QUESTION DIRECTLY, I DO NOT KNOW HOW THE DIRECTOR BECAME AWARE THAT WE ISSUED A --

THE COURT: DOESN'T THE COURT NEED TO KNOW THAT IN AN EFFORT TO DETERMINE WHETHER THE ACTIONS OF THE GOVERNMENT ARE INDEED ARBITRARY AND CAPRICIOUS?

MR. BAER: I DON'T BELIEVE SO, YOUR HONOR, BECAUSE THE ISSUE IS, IS THERE A SCIENTIFIC BASIS, A REASONABLE SCIENTIFIC BASIS, TO WITHDRAW IT? AND IS THAT ARBITRARY AND CAPRICIOUS? PLAINTIFF DOESN'T EVEN CHALLENGE THE REASONABLENESS. NOW, THEY HAVE SOME PROCEDURAL ISSUES THEY ARGUE WITH, BUT THE ACTUAL ISSUES OF THE SCIENTIFIC CONCERNS, THEY DO NOT CHALLENGE. THEY ADMIT THAT THIS IS NOVEL SCIENCE, THIS IS UNKNOWN. THEY SAY IT WORKS. THEY SAY IT'S DIFFERENT, THAT THEY HAVE TAKEN QUANTUM MECHANICS TO A NEW LEVEL.

THE COURT: SO NO ONE, THE PLAINTIFFS ARE NOT ASKING THE COURT TO FOCUS ON THE REASONS LEADING UP TO OR THE FACTS OR CIRCUMSTANCES LEADING UP TO THE DIRECTOR'S CONSIDERATION OF THE 935 PATENT?

MR. BAER: I DON'T BELIEVE SO. THEY WITHDREW THAT.

THE COURT: NO ONE IS CASTING ANY SINISTER ALLEGATIONS

(PAUSE) --

MR. SELTER: WE'RE SAYING FOR PURPOSES OF THE MOTION FOR SUMMARY JUDGMENT, SINCE THEY DISPUTE IT IN THEIR AFFIDAVIT, WE ARE NOT RAISING THAT AS A POINT, BUT WE DO BELIEVE THAT IT OCCURRED. AND SIGNIFICANTLY, I'VE YET TO HEAR FROM MR. BAER. I MEAN, IT'S A FACT IT'S DISPUTED, BECAUSE WE WANT A DECISION ON --

THE COURT: YOU CAN'T HAVE IT BOTH WAYS, COUNSEL. YOU'RE NOT RAISING IT AS A POINT. CORRECT?

MR. SELTER: WE'RE NOT RAISING IT AS A POINT.

THE COURT: ALL RIGHT.

MR. SELTER: BUT WE WILL NEED A DECISION TO BE RESOLVED FOR PURPOSES OF THE SUMMARY JUDGMENT.

THE COURT: I JUST WANT THE RECORD CLEAR ON THAT. ALL RIGHT, THANK YOU.

ALL RIGHT.

MR. BAER: YOUR HONOR, EVEN --

THE COURT: IT'S NOT A POINT.

MR. BAER: OKAY. I WOULD EVEN SAY, YOUR HONOR, YOU COULD IMAGINE IN YOUR HEAD ANY SCENARIO OF HOW WE LEARNED ABOUT IT. A BLIMP FLYING OVER US. IT DOESN'T MATTER, BECAUSE WHAT MATTERS, YOUR HONOR, IS THE DECISION ITSELF. IS THERE A REASONABLE, NON-ARBITRARY REASON BASED ON THE SCIENCE, BASED ON THE PATENTABILITY, TO WITHDRAW THIS APPLICATION FROM ISSUE? THE ANSWER IS YES. PLAINTIFF DOES NOT CHALLENGE THAT.

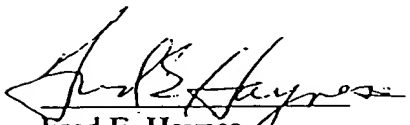
UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

BLACKLIGHT POWER, INC. Plaintiff, v. Q. TODD DICKINSON Director of the United States Patent and Trademark Office Defendant.	Civil Action No. 00 CV 0422 (EGS)

DEFENDANT'S OPPOSITION TO PLAINTIFF'S
MOTION TO AMEND THE SCHDEDULING ORDER

Defendant, Q. Todd Dickinson, Director of the United States Patent and Trademark Office ("Director"), respectfully opposes plaintiff's motion for an open-ended stay because no further stay is warranted and any additional stay will serve as an unjustified restraint against lawful government activity. Although plaintiff fails to ask properly for a preliminary injunction, plaintiff is seeking, in effect, a preliminary injunction against the United States. The motion should be denied for three independent reasons. First, plaintiff's failure to seek a preliminary injunction under Federal Rule of Civil Procedure 65 should summarily preclude the relief requested. Second, assuming that this Court treats plaintiff's motion to amend the scheduling order as a proper motion for a preliminary injunction, then the motion should be denied because plaintiff has failed to articulate any basis for a preliminary injunction. Last, if this Court reviews the merits of a theoretical request for a preliminary injunction, then a preliminary injunction should be denied

Mark E. Nagle
D.C. Bar #416364
Assistant U.S. Attorney



Fred E. Haynes
D.C. Bar # 165654
Assistant U.S. Attorney
555 4th Street N.W.
Washington, D.C. 20001

(202) 514-7201

Of Counsel
Kevin Baer
D.C. Bar # 450192
Marshall Honeyman 9035 305-4469
Eric Grimes
Associate Solicitors
U.S. Patent and Trademark Office